HUMANITARIAN ARCHITECTURE AND THE CREATION OF SCHOOLS FOR DISADVANTAGED COMMUNITIES IN CHINA

Thesis submitted to the University of Nottingham

for the degree of Doctor of Philosophy

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Abstract

In the past few decades, there has been increasing global concern for people in developing countries who are suffering from disasters, diseases, poverty, etc. As a result, many charitable organizations, architects, universities, and others have become involved in humanitarian projects to help alleviate these social problems by utilizing architectural design skills. Humanitarian architecture provides solutions in response to natural- and man-made societal or environmental problems and its scope can be broadly classified into two categories: 'post-disaster' and 'socio-economic community development' projects. Significantly, in recent years there have been also increasing concerns about the roles and responsibilities of architects and the appropriateness of humanitarian architecture. Similar to the global picture, research into post-disaster humanitarian architecture in China has increased significantly in recent years, however, research into 'non-disaster relief' projects focused on socio-economic development is rare.

The rapidly developing economy in China has resulted in the gap between rich and poor becoming wider particularly in relation to the standard of education and school facilities between urban and rural areas. This situation has particularly affected migrant workers, who are the products of the unique urban-rural system in China. They move to cities for

employment opportunities leaving their rural 'left-behind children' in their hometowns or villages.

The topic of this thesis is Humanitarian Architecture and the Creation of Schools for Disadvantaged Communities in China. The central aim of this PhD research is to understand and help improve the non-disaster relief humanitarian architecture process in the provision of schools in the disadvantaged communities of China. The research in this thesis has approached the phenomenon of humanitarian school projects for under-developed communities in China by focusing on three specific case studies, the Bridge School project, the Xiashan Primary School project, and the Xiuning Shuanglong Primary School project. The research methodology of this PhD research is qualitative research method with case studies, where documentations, interviews, participant observation are the main methods to carry out the case studies. This thesis has also articulated the delivery mechanisms for each project, issues and challenges, and the impact on the local community through a comparison of the three projects. The research project's methodology, research methods application, and the potential gaps and weaknesses has been examined to draw lessons in relation to future of research into humanitarian architecture.

This thesis has provided an extensive literature review on humanitarian architecture in relation of schools in the Chinese context at a PhD level. It has provided literature reviews on what is humanitarian architecture, the history of humanitarian architecture,

the arguments on humanitarian architecture along the history and how current humanitarian architecture projects are working in terms of both global context and Chinese context and it discussed the potentials to propose an improved model for the practice of humanitarian architecture in China.

Acknowledgements: The Personal Context

In the beginning of this thesis, I would like to draw a picture of my personal context of this research. My personal interest in humanitarian architecture and school projects was firstly development in my volunteering experiences worked with children in need as a member of the Youth Volunteer Association, University of Nottingham, Ningbo, China between 2011 and 2012. As a team leader, I worked closely with the children in Ningbo Blind School, Ningbo Special-education Centre and Ningbo Autism Centre and organized the teaching support activity to a mountainous primary school in Anhui, China, however, due to personal reasons, I haven't been to the site finally. The experiences working regularly with the children need help indeed have taught me a lot beyond books.

Later the learning experience as an architecture student in the University of Nottingham has inspired me to help the children in need using my professional skills. In my second year of architecture study, as a part of a group of over 30 students and staff from the University of Nottingham, I joined in the Group (SA) 3 and participated in the design and on-site construction for the final phase of the Khomotso Crèche in Calais Village in rural South Africa. Khomotso Crèche is a nursery school providing a vital step-up for the over 100 children of the village aged from babies up to seven years. During the

build-up of this nursery school in the Easter of 2014, we carried out mentoring activities with local kids to cultivate multicultural understanding and to imbue positive inter-relationship skills in them. This project is under the Design and Build project to South Afirca carried by the University of Nottingham for more than 15 years. It has raised public awareness and improved the learning environment of kindergarteners in Khomotso Crèche. In addition, the theme of my second-year studio projects is primary school design, in which I have learnt more knowledges and inspirations on early-stage school projects in different countries. The experiences of taking part in this charitable design and build project and designing primary schools projects have given me the motivation to do the research of humanitarian architecture in relation to the provision of schools for disadvantaged communities. Nevertheless, after considering the difficulty of obtaining materials and language communication issues, the final decision was made to locate the study case in the disadvantaged communities of my home country, China.

Ultimately, I would like to take this opportunity to write these words to thank a number of people, who have given me a lot of support throughout my research. First of all, I want to thank my husband, Terry for supporting me in all aspects during my long research time for several years, encouraging me when I am down, and providing me more time to concentrate on my research and finish this thesis. Then, I would also thank my parents and parents in law for both their financial and spiritual support on my education so far. In addition, my two lovely children Andy and Bryce are also who I want to thank, they have given me extra happiness and joy throughout the study.

In particular, I would like to thank my supervisor, Professor Tim Heath who has given me fabulous support in both academic field and personal development. Tim Heath is the professor of architecture and urban design at the University of Nottingham where he has been an academic since 1993. He is also a registered architect, qualified town planner and experienced urban designer who is actively engaged in research, teaching and practice through which he pursues his passion for cities and placemaking. Without his knowledgeable and professional guidance, my research could not be completed so smoothly. In addition, I want to thank Mr. John Ramsay and Mr. Peter Russell for providing me suggestions and support as my additional supervisors.

In the end, I am also grateful for those who contributed to this research, including those took part in the interviews and supported me in field case studies. Although it is inconvenient for many people to reveal their names here, I still want to express my sincere thanks to them.

Hang Du

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Table of Contents:

List of Figures

List of Tables

Chapter 1 Research Agenda

1.1 Research Motivation:

As mentioned at the beginning in the Acknowledgements section, the experience as an architecture student in the University of Nottingham has inspired me to help the children in need using my professional skills. In my second year of architecture study, as a part of a group of over 30 students and staff from the University of Nottingham, I joined in the Group (SA) 3 and participated in the design and on-site construction for the final phase of the Khomotso Crèche in Calais Village in rural South Africa.

Khomotso Crèche is a nursery school providing a vital step-up for the over 100 children of the village aged from babies up to seven years. During the build-up of this nursery school in the Easter of 2014, we carried out mentoring activities with local kids to cultivate multicultural understanding and to imbue positive inter-relationship skills in them. This project is under the Design and Build project to South Afircа carried by the University of Nottingham for more than 15 years. It has raised public awareness and improved the learning environment of kindergarteners in Khomotso Crèche. The experience of taking part in this charitable design and build project gives me the motivation to do the research of humanitarian architecture in relation to the provision of schools for disadvantaged communities. After considering the difficulty of obtaining

materials and language communication issues, the final decision was made to locate the study case in the disadvantaged communities of my home country, China.


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Students helping to build better future

By Conor Gaffey

YOUNGSTERS have been gaining skills and changing lives by building a nursery school in South Africa.

Thirty-six architecture students from the University of Nottingham travelled to Limpopo Province, north of Johannesburg.

The students, accompanied by a team of staff, are applying the final touches to Khomotso Crèche, a nursery school providing education for almost 100 two to seven-year-olds.

The first group arrived in Limpopo on April 12. Another group is still there and is set to return to Nottingham on May 11.

Catherine O'Leary, [illegible], has just returned from South Africa.

"It was an amazing opportunity to design something and then actually see it being made before your eyes," said Ms O'Leary, of Lenton.

"It's strange because we only spent a couple of weeks working on it but, for the children, it's life-changing."

Ms O'Leary first heard about the project at a university open day.

"The university has done previous projects in South Africa. It's something different which Nottingham had to offer," she said.

She was also astounded by the behaviour of the children in Limpopo. "They're so well-behaved! I've never seen children sit and listen so well.

"By our standards, they don't have enough teachers. But they don't need it because the children are so amazing."

Staff involved in the trip were impressed by the dedication of the students.

Margaret Mulcahy, 42, is an architecture lecturer at the university. She also returned from South Africa on April 26.

"Physically it was very tough," said Ms Mulcahy.

"The students were on site at [illegible] and didn't leave until 6pm most days.

"All the students worked very hard. It was demanding, but everyone watched out for each other."

The students designed the nursery school themselves and had to raise £1,000 each towards the cost of building materials.

"Because they designed the school themselves, they had a real ownership of it.

"It really is an invaluable experience," added Ms Mulcahy.

The project has also made the students more employable as they return to Nottingham.

"When they go for interviews, these students have got real-life experience which they can talk about and which sets them apart," said Professor Tim Heath, 49.

"The students pick up valuable skills like teamwork and negotiation, whilst also leaving a legacy for future generations in South Africa."

■ Are you involved in a community project? Tell us about it at newsdesk@nottinghampost.com.

Project: Students working on site in South Africa.

Visit: Student Hang Du, above, with youngsters in Limpopo Province, South Africa. Right: Silvi Popova

Figure 1. Newspaper reporting the Khomotso Crèche project in Calais Village in rural South Africa from Nottingham Post in May 2014. Student Left is Hang Du, the researcher of this PhD research.

1.2 Introduction

The need for educational empowerment in the less developed areas cannot be over-emphasized. Apart from the importance of education in the development of human capabilities which would further enhance future developments of these regions, the social consequences of a failure to provide education to the populace of these regions have been a source of great concern globally. Humanitarian architecture in relation to the provision of schools has great impacts on these. An education cannot be given to children without the presence of schools. However, the problem is that far too many populations does not have access to decent shelter, adequate housing, and acceptable school buildings. According to Article 25 Humanitarian Architecture (n.d.) published in its website: “263 million children are out of school world” and “1 in every 10 children are out of school and are excluded from education and classrooms”, whose vision is to provide children with the skills and knowledge they need to grow as individuals by creating an inclusive educational environment in underserved areas. Nevertheless, there are also arguments about how to ensure the humanitarian architecture provided is contextually relevant and satisfy the local communities.

It is essential for architects to take an active role in making the world a better and more sustainable environment. The Sustainable Development Goals (SDGs) have been established in 2016 for all countries which are members of the United Nations to collaborate to end poverty while also protecting the environment, where architects are

required to help achieve these goals. It is important to note that there is one specific trend within architectural practice that has already been working towards these goals for the past 20 years, that is the humanitarian architecture movement. The humanitarian architecture movement encompasses all architectural projects that attempt to address humanitarian crises, and which are frequently located in areas where the administration has difficulties providing basic services to the population. Experience of working in complex situations and with challenging stakeholder relationships is part of the identity of the humanitarian architecture movement. But despite their expertise, the results are often disappointing, and they receive a great deal of criticism from other professionals in the field as a result (Roelse, 2020). To address the challenges, it is important to fully understand the process of a humanitarian architecture project and find the appropriate way to improve the work of humanitarian architects.

As a subset of financial assistance provided by wealthier developed countries, primarily those in the West, to less developed countries somewhere else, the issue of humanitarian architecture is far from new. Whereas the setting of humanitarian architecture here mainly focuses on resulted from natural or man-made disasters. Mostly during the past decade, humanitarian architecture has become a popularized phenomenon, ranging from crowdsourced building plans to studio projects and pro-bono services. However, in recent years, it appears to have lost its shine, and both its financial viability and socio-cultural viability have consistently demonstrated signs of fraying as the community's impacts on it are critiqued more narrowly (Miller, n.d.). Since the 1960s, a number of figures, including architect-theorists like Nabeel Hamdi, Shigeru Ban, and Buckminster

Fuller, have pursued low-cost housing design and emergency relief structures (Powell, 2009). There are significant trending publications alongside the history of humanitarian architecture from the 1970s: the publications by Architecture for Humanity (a United States-based charitable organization launched in 1999 and closed in 2015), Design Like You Give a Damn (2006), Design Like You Give a Damn 2 (2012), the exhibition Design for the Other 90% (Cooper-Hewitt, National Design Museum, New York, 2007), Katie Wakeford's Expanding Architecture: Design As Activism (2008), Emily Pilloton's Design Revolution: 100 Products that Empower People (2009), the exhibition Small Scale Big Change: New Architectures of Social Engagement (MoMA, New York, 2010), Boundaries II A Focus on Humanitarian Architecture (2014). Humanitarian architecture is becoming increasingly popular, which has been especially noticeable in the immediate wake of recent natural catastrophes.

Miller (n.d.: 01) has emphasized that "the attention to the subject is positive; it draws the consideration and services of the architecture profession to real socio-cultural, socio-economic, and socio-ecological problems. The humanitarian design phenomenon, much like the Occupy movement also begins to draw our attention to the other 98% of the built environment." However, the arguments on the role of architects involved in the humanitarian architecture and the conflicts on humanitarian architecture have also persisted over time. A normative humanistic approach to architectural design evokes the idea that architecture is social, just, and ethical because it connects and creates an environment that connects people on a human level. As a result, humanitarian architecture is the art and practice of designing the built environment in which a people

live in order to improve the welfare and happiness of that population. Humanitarian architecture may alleviate suffering and turn conditions into collectively preferred ones through this approach and it works to create a physical environment that benefits society (Miller, n.d.). Then it rises the argument on whether the humanitarian architecture is based on the outcomes or the process. According to Alexander and Davis (1985:123): "the housing process is reestablished as the fundamental human process in which people integrate their values and themselves". In other word, human feelings and human dignity must come first in humanitarian architecture. Turner (1977) also indicates that it is crucial to work with the people as a practitioner of humanitarian architecture and it is important to look at housing as a process. To take part in humanitarian architecture projects, it is essential to understand the inherent resources and abilities within a community in order to create a network of resources.

In reality, "very often, images and testimonies of disaster survivors and newly homeless families in newspapers and on the television inspire well-intentioned architects, industrial designers, and engineers to propose emergency shelters, (often produced by industrialized methods) that seek technical efficiency for rapid mass production" (Lizarralde et al., 2009:06). "It should not be assumed that affected people will accept and occupy housing units that are provided after a disaster. If the housing does not respond to their needs, why should they use it?" (Miller, n.d.: 04). "What is needed is an architecture of change – an architecture that moves the field beyond the design of buildings and toward the design of new processes of engagement with the political

forces that shape theories, practices, academies, policies and communities" (Bell et.al, 2008:18).

The types of humanitarian architecture can be generally classified into three categories, which are the disaster-relief projects, the post-disaster projects, and the socially aware projects (non-disaster relief projects). The disaster-relief projects aim to provide instance support for the communities which are under crises, especially building shelters. While the goal of post-disaster projects is rebuilding cities and communities after they have been torn apart by war or social conflict (Charlesworth, 2007). Within the three types of humanitarian architecture projects, the socially aware projects are usually less clearly defined in the literature, however, they refer to all projects that are "socially conscious," which are typically aimed at communities that are suffering from poverty (Roelse, 2020). Humanitarian architecture focuses not only on the built environment, but also on the social environment. According to Roelse (2020:06): "Humanitarian architecture often happens when a vulnerable community needs something but has no resources to provide it." However, there is a criticism for all the architects involved in humanitarian field if they can work well outside of their comfort context. It is important for humanitarian architects to fully understand the context they are working in, which are different with their normal working context. Apart from the basic physical level, the context here also refers to the cultural level, the historical level, the political level and most importantly the social level. In addition, as humanitarian architecture projects frequently take place in multi-stakeholder environments, the architects often face on challenges on the communication of the project.

The role and responsibilities of architects, as well as the appropriateness of humanitarian architecture, have become increasingly controversial in recent years. The study of post-disaster humanitarian architecture has increased significantly in recent years in China, which is like the international background. However, research into 'non-disaster relief' projects with socially aware is rare in China. The rapid economic development of China has resulted in a widening of the gap between the rich and the poor, particularly in terms of the quality of education and school facilities between urban and rural areas. Migrant workers leave their rural 'left-behind' children in their hometowns or villages to pursue employment opportunities in cities. However, the term 'humanitarian architecture' is not recognized by the Chinese architectural community and similar descriptions tend to refer to "architects involved in the humanitarian field" or "an architect with a humanitarian spirit". The process of humanitarian architecture within Chinese context has its own cultural characters. Dorst (2015:59) identifies that "in expert design practice, research has shown that the design problem is not fixed before the search begins for a satisfactory solution concept. Expert design is more a matter of developing and refining both the formulation of a problem and ideas for a solution in concert, in a process called coevolution." It is important for the architects who have involved in humanitarian architecture projects to look back at the process that they have gone through to have the results. This helps improve the future practices in the field in the future.

The central aim of this PhD research is to understand and help improve the non-disaster relief humanitarian architecture process in the provision of schools in the disadvantaged communities of China. This thesis presents the case study of three different projects, the Bridge School project, the Xiashan Primary School project, and the Xiuning Shuanglong Primary School project that represent three different delivery mechanisms of humanitarian school projects in the disadvantaged communities of China. The thesis will discuss the current humanitarian architecture in relation to the creation of schools by articulating the different delivery process issues and challenges, and the impact on the local community of each project. The research methodology, research methods application, and the potential gaps and weaknesses will be examined and the potential to propose an improved model for the practice of humanitarian architecture in China will be discussed.

The length of this thesis will be divided into six chapters. In the first chapter, the general research background will be introduced, the research motivation, research agendas including research gap, research aims, and objectives will be identified with research questions. In the second chapter, the research background will be described in more detail with literature review from international context to specific Chinese context. The third chapter will discuss the methodology for this research and identify what research methods are used in this PhD research and how they are going to be applied into the research. Then in the fourth chapter, there will be detailed information on how the case studies were carried out in the field work with data collected from the field work. Then it comes to the chapter five with results, synthesis, and discussion for the research. And

in the end, there will be a reflection opportunity in chapter six to review the whole process of this PhD research, where both advantages and limitations of the study will be discussed to draw lessons for any future work.

1.3 Research Agenda

This section will list and summarize the theoretical basis of this research and how to apply it to practical methodology for this thesis. The focus of the research will be discussed, the research gap will be identified with research aims, objective and research questions to be clearly outlined.

1.3.1 The Research Gap

The need for educational empowerment in the less developed areas cannot be over-emphasized. Apart from the importance of education in the development of human capabilities which would further enhance future developments of these regions, the social consequences of a failure to provide education to the populace of these regions have been a source of great concern globally. Humanitarian architecture in relation to the provision of schools has great impact on these, however, there are arguments on how to ensure the humanitarian architecture provided is contextually relevant and satisfy the local communities.

As a subset of financial assistance provided by wealthier developed countries, primarily those in the West, to less developed countries somewhere else, the issue of humanitarian architecture is far from new. Whereas the setting of humanitarian architecture here mainly focuses on resulted from natural or man-made disasters.

Mostly during the past decade, humanitarian architecture has become a popularized phenomenon, ranging from crowdsourced building plans to studio projects and pro-bono services. However, in recent years, it appears to have lost its shine, and both its financial viability and socio-cultural viability have consistently demonstrated signs of fraying as the community's impacts on it are critiqued more narrowly. The attention to the subject is positive; it draws the consideration and services of the architecture profession to real socio-cultural, socio-economic, and socio-ecological problems. However, the arguments on the role of architects involved in the humanitarian architecture and the conflicts on humanitarian architecture have also persisted over time.

The types of humanitarian architecture can be generally classified into three categories, which are the disaster-relief projects, the post-disaster projects, and the socially aware projects, which is non-disaster relief projects. The disaster-relief projects aim to provide instance support for the communities which are under crises, especially building shelters. While the goal of post-disaster projects is rebuilding cities and communities after they have been torn apart by war or social conflict. Within the three types of humanitarian architecture projects, the socially aware projects are usually less clearly

defined in the literature, however, they refer to all projects that are "socially conscious," which are typically aimed at communities that are suffering from poverty.

The role and responsibilities of architects, as well as the appropriateness of humanitarian architecture, have become increasingly controversial in recent years. The study of post-disaster humanitarian architecture has increased significantly in recent years in China, which is like the international background. However, research into 'non-disaster relief' projects with socially aware is rare in China. There is not known PhD level research into non-disaster relief humanitarian architecture in China currently, which gives the opportunity to fill up the literature and provide suggestions for future research. This research therefore focuses upon non-disaster relief 'humanitarian architecture project and aims to fully understand and help improve the non-disaster relief humanitarian architecture process in the provision of schools in the disadvantaged communities of China and to examine the roles and responsibilities of architects involved in the non-disaster relief humanitarian school projects in the disadvantaged communities of China and fill up the literature of PhD level research into non-disaster relief humanitarian architecture in China.

1.3.2 Research Aims and Objectives

The overriding objective of this PhD research is to fully understand the process of humanitarian architecture in the provision of schools for less advantaged communities in China.

The central aim of this PhD research is to understand and help improve the non-disaster relief humanitarian architecture process in the provision of schools in the disadvantaged communities of China. The thesis will critically analyse the current non-disaster relief humanitarian architecture process in the provision of schools from the process inception to realization, until post construction and then discuss the potential to propose an improved model for the practice of humanitarian architecture in China.

To achieve this, the research will focus on three typical case studies from different delivery mechanisms that present the non-disaster relief humanitarian architecture in the disadvantaged communities of China.

1.3.3 Research Questions:

To fully understand and help improve the process of non-disaster relief humanitarian architecture in the provision of schools for less advantaged communities in China, there are four key research questions identified to critically analyse the current non-disaster

relief humanitarian architecture process in the provision of schools in China. These research questions range from the process inception to realization, until post construction with “what” and “how” questions and eleven sub-research questions to address the key research questions in detail.

Key research Questions:

1. What is humanitarian architecture and why is it growing in importance as a means of providing for disadvantaged communities in China?
2. How does humanitarian architecture meet community needs in relation to the provision of schools?
3. What are the barriers and drivers to humanitarian architecture in China and how do these affect the process?
4. How can the process of humanitarian architecture be improved to ensure contextually relevant and successful outcomes in China?

Sub-research Questions:

1. What are the responsibilities of architects involved in the humanitarian architecture in the provision of schools in China, how do these happen and how do these affect the process of the projects?
2. How do universities/private architectural practices/NGOs participate in humanitarian architecture in relation to schools in China?

3. How do different delivery mechanisms affect the success of humanitarian architecture in relation to the provision of schools in China and how can these be improved?
4. Why is the long-term operation of humanitarian school constructions in China needed and how to guarantee that?
5. What are the most basic needs of the disadvantaged communities in China, and how can these basic needs related to education can be satisfied using architectural solutions?
6. How could architects balance between the local basic needs and architectural design innovation?
7. How could designers balance between public voice and personal economic needs when engaged in humanitarian architecture in the provision of schools in China?
8. Why should humanitarian architecture in the provision of schools should be standard (construction, stability, standard, prefabrication) and how could prefabricated humanitarian architecture meet the local circumstances in relation to the provision of schools in China?
9. How successful is the current process of humanitarian architecture in China and what are the unsuccessful aspects and how to improve?
10. Why should sustainable design solutions be provided to the disadvantaged communities of China?

11. Is there any university-affiliated design/build studio or community design centre in China? If not, how could this be introduced to China?

However, some sub-research questions have been changed or merged into other sub-research questions during the research process.

SRQ2 and SRQ3 have been merged into: How do different delivery mechanisms work in humanitarian architecture projects in relation to the provision of schools in China and how can these be improved?

SRQ5 and SRQ6 have been grouped together.

1.4 Contribution to Knowledge

This thesis has firstly provided an extensive literature review on humanitarian architecture in relation of schools in the Chinese context at a PhD level. It has provided literature reviews on what is humanitarian architecture, the history of humanitarian architecture, the arguments on humanitarian architecture along the history and how current humanitarian architecture projects are working in terms of both global context and Chinese context and it discussed the potentials and considerations to propose an improved model for the practice of humanitarian architecture in China. The research findings approved the non-disaster relief humanitarian architecture in China is still in progress and the research into this field is not too much and have given more details to the literature of humanitarian architecture in relation to schools in China.

Chapter 2: Research Background and Literature Review

Introduction

This chapter will introduce the research background of this study in detail from the international context to specific Chinese context. First, the global context of humanitarian architecture will be discussed to give a general background for the research. The definitions of humanitarian architecture will be discussed, and the history of humanitarian architecture will be looked back to evaluate the humanitarian architecture, the arguments on humanitarian architecture along the history and how current humanitarian architecture projects are working. Then humanitarian architecture within Chinese context will be discussed to explore the research opportunity.

2.1 Humanitarian Architecture: The Global Context

"What counts in life is not the mere fact that we have lived. It is what difference we have made to the lives of others that will determine the significance of the life we lead."

- Nelson Mandela (2002)

Nighty-eight percent of the population that does really need the architectural design services, but cannot afford one (Bell, 2004). "But how can architects increase the

number of people that they serve? First, they must reassess the service and benefits architecture probides. Defining those is necessary, because the greater public- the 98 percent without access to architects- certainly does not understand what architects do, and it is the architects' task, not the public's, to present the reasons that design can help" (Bell, 2004: 13). It is a global concern that not just people in the developing countries, suffering from diseases, poverty, etc. In addition, "of perhaps a greater, more holistic concern worldwide is the impact felt because of depressed or inequitable socioeconomic conditions, if only because this phenomenon is not dependent on the unpredictability of weather," climate, regional or political damage. "Rather, it is a result of the predictability of business and economic policy" (Wilmes, 2015:41). As Jim Wallis, Christian theologist raised in Fletcher in 2005: "Sometimes it takes a natural disaster to reveal a social disaster" (Jim Wallis, Christian theologist, in Fletcher, 2005).

For decades, architects have been involved in humanitarian aid to solve problems by architectural design skills after increased crises, whether in the world's poorest country or the wealthiest. The World Disasters Report 2016 by International Federation Red Cross noted that "the number of disasters continues to rise, in a result of a combination of increased vulnerability (from more people living in dangerous places) and climate change. During 2015, a total of 574 reported disasters, caused by earthquakes, floods, landslides and heat waves, had killed almost 32,550 people, affected over 108 million people, and caused US$70.3 billion in damage." (IFRC, 2016: 12-13) However, most of the issues happened in the developing countries. Architects do play a special role in the post-disaster recovery. Recently, there are more and more concerns about the value

of humanitarian architecture and the responsibility of architects. Some years ago, Le Corbusier (1931: 265) stated that: "we are dealing with an urgent problem of our epoch, nay more, with the problem of our epoch. The balance of society comes down to a question of building. We conclude with these justifiable alternatives: Architecture or Revolution. Revolution can be avoided." This section will clarify the definitions of humanitarian architecture and sort them by relating to Maslow's hierarchy of human needs, review the history and evolution of humanitarian design, identify the key issues and challenges of humanitarian architecture, and discuss the responsibility and roles of architects within humanitarian field.

2.1.1 Defining Humanitarian Architecture

Although architects and humanitarian architecture are considered to offer only a late response to disasters, in recent years, concern for disadvantaged people and communities has been increasingly expressed by both public and architects. Compared with public-interest architecture, humanitarian architecture has tended to be considered only as post-disaster architecture. However, throughout history, humanitarian architecture has taken a role in improving welfare for all human beings in different fields. The architect Samuel Mockbee has quoted in Sinclair and Stohr (2006: 50) that "Everybody wants the same thing, rich or poor… not only a warm, dry room, but a shelter for the soul." Humanitarian architecture is assumed to provide appropriate design solutions for the other 90 Per Cent (Chun and Brisson, 2015). As Take the Social Economic Environmental Design Network (SEED) for example, the agency focuses not

on the rich, but on the people who need architectural services but cannot afford. In the process of ascertaining the scope of humanitarian architecture, a key question is how to judge whether architecture is humanitarian or not. Charlesworth (2014: 4) argues that all architecture is humanitarian architecture, as it serves specific groups of people. He defines "humanitarian" as "having a concern for and wanting to help improve the welfare of people in need." Therefore, humanitarian architecture is basically architecture designed for people in need. Since architecture essentially provides design solutions to related problems for a range of community groups, all architecture should be humanitarian (Charlesworth, 2014). However, Chun and Brisson (2015: 19) argue that humanitarian architecture is a specific and necessary genre of architecture that "takes as its focus the marginalized, underserved, crisis-threatened people of the world, where mainstream practices and industries have failed them." Although all architecture focuses on providing comforts, utility and "life and safety" to people, shelter for different populations fails to live up to the same quality of comfort and care.

Maslow's hierarchy of human needs can help to define humanitarian architecture more clearly. It depicts human needs as five hierarchical levels within a pyramid. Humanitarian architecture can be defined according to human needs. Maslow's original five-stage hierarchy of needs (table 1) includes: biological and physiological needs, safety needs, love and belongingness needs, esteem needs and self-actualization needs (McLeod, 2016).

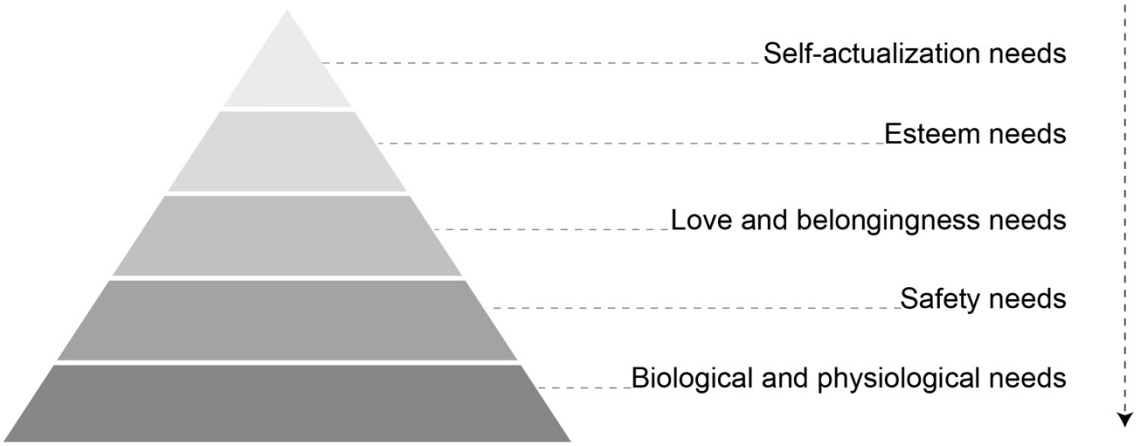

Table 1. Maslow's original hierarchy of human needs five-stage model (Simply Psychology. 2016).

At the most basic level, humanitarian architecture is much more about surviving, where human needs are biological and physiological: air, food, drink, shelter, warmth, sex, sleep. In this field, humanitarian architecture means using professional design skills to solve technical problems and build satisfactory homes for people in emergencies, especially after social conflict, war, and natural disasters (Charlesworth, 2014). In emergencies, humanitarian architecture equals post-disaster architecture. This is the most common definition of humanitarian architecture, which regards architecture as about "much more than just drawing conceptual designs, resolving technical issues and building 'well-designed' structures for an informed client" (Charlesworth, 2014).

However, Charlesworth (2014) also clarified that the purpose of humanitarian architecture not only to solve problems immediately after the disaster of a crisis, but also to complete the post-disaster reconstruction step by step. "It is much more about working, listening and collaborating with disaster-affected communities well beyond

the aftermath of an earthquake, tsunami or flood; to slowly rebuild their society, culture, economy and physical environment" (Charlesworth, 2014). As pointed by David Kratzer, the "provision of shelter can solve 'houselessness' – an episodic temporary loss of shelter. The more difficult problem is with chronic homelessness" (Kratzer, 2014: 524). Here it reflects a higher level of human needs: safety, protection from elements, security, order, law, stability, and freedom from fear.

Gradually, people need trade economy and viable rural requires. Consequently, the definition of humanitarian architecture can be compared with "public-interest architecture". Bell and Wakeford (2008) represent "public-interest design" as design seeks to address issues of social justice, allow individuals and communities to plan and celebrate their own lives, and serve a much larger percentage of the population than it has in the past. "Public-interest architecture" is always accompanied by political issues and focus on the people who cannot pay design fees but do need design services even more than the top one percent of the world: the wealthy. However, Murphy (2013) argued in the interview for the book "Humanitarian Architecture: 15 stories of architects working after disaster" that all architecture is political (Charlesworth, 2014). Similarly, Rieff (2003: 254) believes that without critical contextual analysis and hard political decisions, "there can be no humanitarian solution to humanitarian problems". The rise of humanitarian architecture is in parallel with "public-interest" (Charlesworth, 2014), and in some case, the essence of humanitarian architecture can be shift to the label of "public-interest architecture" (Chun and Brisson, 2015).

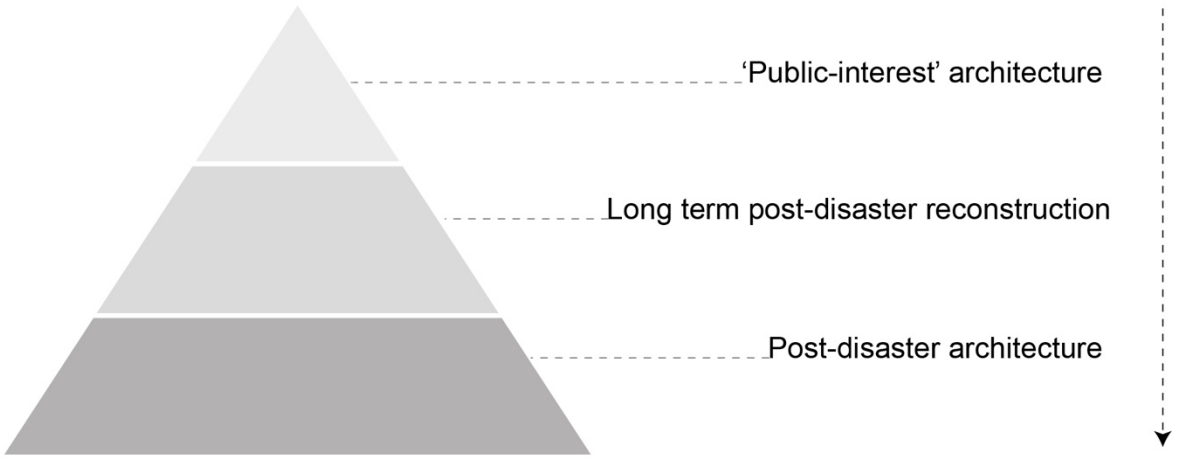

Table 2. Definitions of humanitarian architecture in accordable with Maslow's original hierarchy of human needs.

Furthermore, Hubert and Theocharopoulou (2015: 20) argued that humanitarian architecture should be defined in a more general background by stating that: "We will focus on those features of the humanitarian impulse that extend to all humans qua human beings. And that is the view we will trace the history of humanitarian architecture."

The definition of humanitarian architecture is changing all the time by tracing the history. In 21st century, humanitarian architecture is defined as good design which bridges both ethics and aesthetics (Chun and Brisson, 2015). People begin to pay more attention on what they have done. Citizenship, community, advocacy and empathy are ideas that can hide larger social dynamics while glorifying individuals' choice to 'do good'" (Goodman, 2014: 512), in which community defines the appropriate scale and subjects of intervention; advocacy describes how architects can represent or 'speak for' others; empathy helps them listen so they will know what to say and do. The result is

architectural citizenship, a state of seeing, knowing and acting ethically" (Goodman, 2014: 504). In addition, "we cannot separate sustainable design and public-interest design; both involve figuring out how over 7 billion of us can thrive on this one planet. If anything, I see public-interest design helping us achieve the kind of sustainability goals that we need to reach" (Fisher, 2014). Storm water management, rainwater reuse strategies, repurposed materials, highly reflective roof surfaces, and native plant species are all strategies that have been incorporated into sustainable design since its mainstream re-emergence in architectural practise and education in the last two decades (Wilmes, 2015). As Colantonio and Dixon (2011) indicated that promoting economic growth, maintaining social inclusion, and minimizing environmental impact are equally crucial to asset-based design.

The subject of "Humanitarian architecture" has risen within the first two decades of the twenty-first century, which goes by many names, such as refined as "public interest design", "community design", "design for the underserved", "design for the broader good", "pro bono design", "socially conscious, socially just, and socially aware design", as well as "asset- and needs-based design" (Wilmes, 2015). As described by Bell (2010: 76): "Public interest designers help to define problems and locate opportunities where design has the potential to change the lives of individual people and communities". With the concept of responding through architecture, humanitarian architecture provides solutions in response to natural and man-made societal or environmental problems. In terms of asset-based design, these three principles are completely relevant: promoting

economic growth, preserving social inclusion, and minimising environmental impact (Colantonio and Dixon, 2011).

2.1.2 History and Evolution of Humanitarian Architecture

"We might think of the efforts to reform inner-city tenement housing as the first instance of humanitarian design, at least in aspiration" Hubert and Theocharopoulou (2015: 33).

While there is an increasing body of work that shows the variety of humanitarian architecture design projects, less attention has been paid to how contemporary public interest design builds on and integrates with traditional design processes, philosophy, and social impact. The history of humanitarian architecture can be traced back to the attempts to reform inner-city tenement housing for workers and the poor from two hundred and fifty years ago. In the 1840s, housing reform began with campaigns for constructing better homes for slum dwellers. Slums affected human beings as regards not only health but the human condition in general. This concept of slums first came from "moral environmentalism" (Von Hoffman, 1998: 4). In 1847, it was reported in the annual report of the New York Association for Improving the Condition of the Poor (AICP) that due to poor housing conditions, the people living in the slum "suffer from sickness and premature mortality; their ability for self-maintenance is thereby destroyed; social habits and moral are debased, and a vast amount of wretchedness, pauperism, and crime is produced" (AICP, 1847: 23). Similarly, Ford (1936: 13) defined a slum as "a residential area in which the housing is so deteriorated, so substandard or

so unwholesome as to be a menace to the health, safety, morality, or welfare of the occupants."

In the 1920s, architects began to use their professional skills to solve such social problems. Later, particularly after the World wars, architects attempted to use industrial products and improvements in prefabrication developed during the wars and apply them to economic housing. Also, in the twentieth century, housing reform generally cooperated with government projects.

However, in the 1950s, many Western architects were questioning both the political and technical areas. Therefore, these architects began to seek more efficient and proper ways to help the disadvantaged communities, who needed help indeed but could not afford to get intervention from the professions. For example, Whitney M. Young Jr. argued in the 1968 AIA Conference in Portland that: "As a profession, you are not one that has distinguished itself by your social and civic contributions to the cause of civil rights. You are most distinguished by your thunderous silence and your complete irrelevance" (Sampo, 2014: 75). This expressed the distress of minorities and low-income earners in terms of housing conditions (Sampo, 2014). However, in the same way, John F.C. Turner, who was one of the first Western architects working closely with the poor, learnt from the lessons of illegal squatter settlements that: "far from being the threatening symptoms of social malaise, were a triumph of self-help which, overcame the culture of poverty, evolving over time into fully serviced suburbs, giving their occupants a

foothold in the urban economy" (Turner, 1976: 13). Turner (1976) also argued that people should not only have the freedom to build their homes, but also can manage the entire administrative process. However, his ideas clashed with the interests of large corporations, unlike the interests of minorities, which were well represented in the political sphere, making participatory planning inefficient when people with low income clearly lack means.

Similarly, the term 'advocacy planning' was proposed by the architect Paul Davidoff in 1965. 'Advocacy planning' means "the exercise of the planning function on behalf of specific individuals and groups, rather than on behalf of a broadly defined 'public interest'" (Davidoff and Gold, 1970: 13). Later, the concept of advocacy planning was developed by Goodman (1971: 11), who pointed out that: "planners are invisible symbols of oppression and repression", and advocacy planning is likely to be only a mask if planning is used as "a sophisticated weapon to maintain the existing control under a mask of rationality, efficiency and science." During his teaching at MIT, he carried out some experiments called "Guerrilla Architecture", in which he proved that direct action was more effective than adapting to existing bureaucratic techniques (Sampo, 2014). Similar experiments, such as self-help housing and aided self-help were promoted in the following decade, for example, Villa el Salvador in Lima, the cite Ben Omar in Algeria, the communities of the architect Fernando Castillo in Chile, the Tierra community by Architect Claudio Caveri in Argentina, the Uruguayan Cooperative Centre and the neighbourhoods of Carlos Gonzalez Lobo in Mexico and the Operacion Sitio began in Chile (Sampo, 2014). The awareness of the importance of building in

cooperation was raised since the cooperative movements for self-building. As the architect Fernando Castillo proved in his community projects, there were significant differences between the commercial housing projects and the projects building for their own homes. Residents participated and assisted the architect in the construction of houses according to their own needs from the overall design to every single house (Sampo, 2014). Similarly, Shigeru Ban has suggested after the 2011 Japan Earthquake that "we cannot make a universal prototype for temporary shelter like the universal solutions that the medical profession has for different diseases. That's why I think it's easier to send a doctor over there to help the people but, in architecture, there is no universal solution. You must have the local people working with local architects" (Charlesworth, 2014: 269).

Then, from the 1970s, many international NGOs and non-for-profit agencies began to work for humanitarian architecture, such as Habitat for Humanity in 1976 whose vision is "a world where everyone has a decent place to live" and mission is "to bring people together to build homes, communities and hope"; Architects, Designers and Planners for Social Responsibility (ADPSR) in 1981 that works aiming to bring "peace, environmental protection, sustainable architecture, social justice and for the development of healthy communities"; Architecture for Humanity in 1999, and so on. These initiatives have created the first open-source community on the net which enables the information sharing among designers and collaboration with other projects around the world (Sampo, 2014: 79).

However, when it comes to the 21st century, the problems still haven't been solved. Generally, the living conditions of the poor have not been improved a lot, the potential of humanitarian architecture is still mostly unplumbed, and the training of the younger professions is still not enough as well. The concern is the relationships between workers and users. On one hand, some inhabitants don't receive the help from the architects, although that can make them live better. On the other hand, "governments focus on large, specialized enterprises, to build 'modern' housing too expensive for a large part of the population" (Benevolo, 2003: 927). As Benevolo (2003: 928) pointed out that: "The structure of the settlements, rather than a final consequence of working relationships, thus becomes a precondition that supports the existing social hierarchy, and also the ground for the political struggle which tries to change it." Today, humanitarian architecture is confronting with great challenge. There is "the shortfall in supply to the demands of housing the poor, in both first and third world countries, despite all the innovations and investment so far" (Hamdi, 1995: 03).

2.1.3 The Arguments for Humanitarian Architecture

The role and responsibility of architects and the purpose of humanitarian architecture have begun to be questioned particularly since the Indian Ocean tsunami in 2004, in which more than 200,000 people have been killed. Many architects and engineers have been working in the field of disaster-relief humanitarian architecture for a long while, however, the efficiency and sustainability of their work have been argued. There are

troubling gaps between humanitarian aid targeting the short-term recovery and the ability of people to rebuild housing and communities well. The aid agencies are willing, but they always don't have architectural skills, as a result, the buildings constructed to rebuild the society are usually unsatisfied (Aquilino et al., 2011). Consequently, as Charlesworth (2014: 4) argued, the role of architects "in the aid and development fields has been more recognized as logistical and technical rather than part of the larger process of design thinking that might contribute to the physical and social reconstruction of devastated communities, cities and landscapes." It has been an exceptional odyssey and opportunity to work in humanitarian architecture field (Charlesworth, 2014).

David Sanderson and Dana Cuff have similar ideas toward this policy. Both Sanderson and Cuff suggested that there are quite a lot of failed design in the post-disaster construction (Charlesworth, 2014). Sanderson (2010: 3) suggested that: "Architects are often the last people needed in disaster reconstruction" and many post-disaster projects have ignored "genuine participation by affected people". Generally, although the emergency activities haven been actively implemented to rebuild the broken communities, there have been insufficient strategic spatial problem-solving and design-led solutions for longer-term recovery. Architects are now being challenged to use design solutions to help the people most in need of help, especially those who are unable to afford the fees of an architectural practice in the post-disaster reconstruction (Schneider & Till, 2009). As described by Bell (2010:76), "Public interest designers help to define problems and locate opportunities where design has the potential to

change the lives of individual people and communities". Design is "an enabler of positive change in day-to-day life, a place where identity, character, daily life, and even the spirits of the users are manifest" rather than simply "the arrangement of materials and space" (Gutman, Cuff and Bell, 2010:77).

Nevertheless, with the contribution of architectural design agencies through skilled consultation and the development of both short- and long- term reconstruction planning, humanitarian architectural knowledge does play a critical role in applying spatial solutions for the shelter and facilities destroyed by disasters. Humanitarian agencies, all share a common target, which is “to ensure a long-term and sustainable reconstruction process that contributes to rebuilding destroyed housing, villages, cities and livelihoods” (Charlesworth, 2014: 8; 14), and good design can play an important role in this. Thus, architectural design agencies that participate in this process can be regarded as humanitarian. By using new perfricated constructions and low-cost, energy-saving and environmentally friendly materials, the professional designers have brought affordable solutions to the disadvantaged communities with high technologies, which also bridged the gap between the short-term emergency needs and long-term sustainable recovery (Aquilino et al., 2011).

2.1.4 Good Design for Human and Global Crises

“I believe that design is problem solving with grace and foresight. I believe that design is a human instinct, that people are inherently optimistic, that every man is a designer

and that every problem can either be a design problem or solved with a design solution'' (Emily Pilloton quoted in Depoy and Gilson, 2014:245).

Historically, the conventional methods for dealing with complex human settlements are unsatisfactory and have left architects and professions investigating more efficient ways to solve problems and emphasizing good design as "a critical and necessary human right" (Chun & Brisson, 2015). Humanitarian design can be defined as good design in some way and aesthetic and ethical questions regarding good have been asked frequently since the 1850s. For example, the Arts and Crafts movement as it advocated that "good, moral design could only come from a good and moral society". As mentioned above, the inner-city housing reform movement is regarded as the first inspiration of humanitarian design, when designers began to seek social solutions by using architectural knowledge. Nowadays, the definition of good design needs to be refined. Rather than coping with the requirements of specific individuals, Chun & Brisson (2015: 34) argue that the shared and communal values of good design should be considered and used as a primary concept, in which is "for design to be good, it must do good." Design must address social problems, including political, environmental, and cultural problems and even confront global issues.

Recently, the need for architectural responses to social problems in post-disaster reconstruction has increased, even though supply falls short of demand. On the disaster of Typhoon Haiyan in the Philippines, Brett Moore (quoted in Charlesworth, 2014: 13)

commented that: “Despite the enormity of the disaster here, it is almost impossible to get trained architects or planners for the complex task ahead of rebuilding the shelters and settlements brutally destroyed by Typhoon Haiyan”. Moore also argues that: “Architects are one of the few professional groups that are educated in how to manage projects, to look at a problem and think of a succinct, rational solution with budget, materials, people involved, that also addresses a human rights issue- in this case, the right to safe and dignified shelter” (Charlesworth, 2014: 13).

Nevertheless, the routes by which architects can become involved in post-disaster planning are still limited, for which the lack of training in most design and architecture schools might be a reason. Marie Aquilino comments in the book Beyond Shelter: “There is still no career path that prepares students to work as urgentistes – design professionals who intervene at a crucial moment in the recovery process to produce enduring solutions” (Aquilino et al., 2011: 7). In addition, architects Lizzie Babister, Shigeru Ban and Sandra D’Urzo all agree that the education of architects in most Western countries does not prepare them enough to do humanitarian work, but is much more focussed on the rich, rather than on people in need, who are in more need of architectural consultation. (Charlesworth, 2014). However, increased numbers of disasters mean that the demand for an architectural response to post-disaster recovery has never been so urgent.

"Safety lies somewhere beyond shelter, in the freedom of being secure enough to relax, play, aspire, and dream of generations."

(Beyond Shelter, 2011)

2.1.5 Humanitarian Architects and Organizations

Generally, architects involved in humanitarian architecture can be divided into three groups: architects in private practice, university research architects and non-government organization/international aid-based architects (Charlesworth, 2014). These humanitarian architects normally work together with other humanitarian agencies to give support to specific post-disaster reconstruction projects. There is a critical role of the architects working within humanitarian field, that is "alongside other international development professionals in designing and implementing strategic spatial solutions for shelter and infrastructure destroyed by disaster-related events" (Charlesworth, 2014: 270). However, "together" here can mean not only "solving problems", but also understanding the clients together, because humanitarian architects tend to have significantly different cultural backgrounds from the people they are working for. Thus, greater awareness is required of the importance of meeting specific needs of local clients and of potential gaps between design concept and realization have increased (Sampo et al., 2014). Sampo et al. (2014: 3) also write that cooperation of this kind is "very often, but not always not-for-profit", and is often based on donations and volunteering. Donations connote the involvement of large companies with the interests to gain market visibility, however, a good humanitarian design may not achieve this. Where

volunteering can be a business by its own and institutions, associations and universities always have such agencies to acquire volunteers with low cost or sometimes free (Sampo, 2014).

Skilled humanitarian architects typically work in cooperation with different stakeholders and communities in a specific context. Rieff (2003) argues that without critical contextual and political considerations, there will not be any humanitarian solution to humanitarian problems. Similarly, Aquilino et al. (2011) pointed out that NGOs, government agencies and local residents themselves cooperate together to solve humanitarian problems in crises. Rather than working by their own, architects should engage with other humanitarian experts in all humanitarian fields.

According to the report of "Chapter 3 Humanitarian NGOs: challenges and trends" by Abby Stoddard in 2003, between 1980 and 1990 the number of northern NGOs nearly doubled, from 1600 to more than 2500 (originally cited from Lindenberg and Bryant, 2001:3). Recently, non-governmental humanitarian organizations (humanitarian NGOs), mainly based in the US and Europe have become prominent supporters of worldwide humanitarian architecture (Stoddard, 2002). (Figure 1.) And there are probably about 3000 to 4000 international NGOs in the Northern industrialised states, including development, relief, and social organisations (Stoddard, 2003, originally cited from Stoddard and Forman, 2002). CARE, Catholic Relief Services (CRS), Medecins Sans Frontieres (MSF), Oxfam, Save the Children and World Vision are the major

humanitarian NGOs. In emergencies, these NGOs always act as leaders for other smaller humanitarian. Although these major NGOs have various corporate structures, for example, CARE and World Vision have strong central corporation, while MSF and Oxfam have a looser umbrella structure in some fields, they all have expanded from basic emergency aid supplies to long-term, sustainable (Stoddard, 2002). Compared with the UN, humanitarian NGOs are in charge of a larger share of humanitarian resources with restricted contributing regulations (Macrae et al., 2002). Although there are no specific figures on the amount of humanitarian assistance provided through non-governmental organizations, it is estimated that they receive about a quarter of the government's humanitarian expenditures (Stoddard, 2003). Humanitarian NGOs have filled in the gaps that governments failed to do in humanitarian crises.

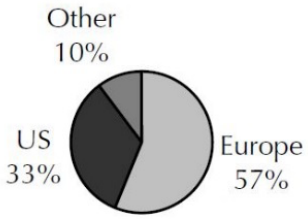

Table 3. Operational Humanitarian NGOs Based in Industrialised States (Stoddard, 2002)

In terms of humanitarian traditions, there are three traditions: the religious, the 'Dunantist' and the 'Wilsonian" humanitarian tradition. In which the religious is the oldest humanitarian tradition within the three and is based on the basic principles of compassion and charitable service. CSR, CAFOD and World Vision International are the NGOs running under the religious tradition. The 'Dunantist' tradition is independent of government and closely coordinated in humanitarian field. Save the Children UK,

Oxfam, MSF are major NGOs follows the 'Dunantist' tradition. As for the 'Wilsonian' tradition, it is mainly applied for US NGOs, like CARE and Dutch NGOs. The 'Wilsonian' squint towards practical and operational, and practice moves back and forth between NGOs and governments (Stoddard, 2003).

Nowadays, concerns about how to do humanitarian design have increasingly been raised. Cameron (2012), cofounder of Architecture for Humanity has discussed in an interview that "cultural sustainability should be more important than environmental sustainability", and architects should have "an inherent curiosity and respect for the community they work in, and a willingness to learn from them". Subsequently, Aquilino et al. (2011: 8) noted in Beyond Shelter that: "The highly skilled architects and leaders are at the front of the use of low-cost, energy-saving, environmentally sound materials and new methods of prefabrication. They have discovered ways to bring affordable high-tech solutions to vulnerable communities. These teams are experts in how best to bridge the gap that separates short-term emergency needs from long-term sustainable recovery and they are experienced in helping reduce future risk, promote awareness, and protect relief investment." As Brundtland (1987) states the development that fulfils the present demands without compromising the ability of future generations to satisfy their own needs is defined as sustainable development. In a word, like Sam Mockbee argued about the objective of humanitarian architects that: "you have to have the confidence that the skills that you can bring to the table will have a dramatic effect on the community in which you are serving". (Sinclair & Stohr eds., 2006: 14)

2.1.6 The Origins of Modern Architectural Education and Design-Build Studios

A corrosive dynamic appears to have emerged in the twenty-first century, as technology has made knowledge more freely accessible to more people in more places at a faster rate than ever before (Wilmes, 2015). However, the relationship between teachers and students in architecture education is never simple. As Wilmes (2015: 01) describes, this relationship is "often a complex, shifting array of dos and don'ts, of successes and – in their minds – far too many failures." So, it is essential to give a background of the modern architectural education, which helps future design and build studios to get started.

Trace back to the history, the first organized professional curriculum for training students to be practicing architects was evolved from "An Outline of a Course of Architectural Instruction" wrote by William Robert Ware (1832-1915) in 1866 that was adopted by MIT in 1868 (MIT, 1996). Within the structure of this architectural pupillage, the master architects passed knowledge systemically to the pupil only "when the master architect deemed the pupil ready were their considered so" (Wilmes, 2015). This system did well in preparing the pupil for essentials knowledge to become a self-practicing architect, but it was not a democratic way to express and communicate architectural ideas.

MIT was regarded as the first architecture school within a higher institution in the United States to exchange architectural knowledge and skills (Ware, 1866). However, the truly first architecture school in the world was not MIT, but a school with only four students created by Richard Morris Hunt (1827-1895) at the Tenth Street Studio Building in 1855 (TFAQI, 2007).

Morris was the first American to graduate from the Ecole des Beaux-Arts in France (McCullough, 2011). The Ecole des Beaux-Arts is the beginning of shifting the role of architect from builder into aestheticians and "was intend to create art, or architecture as an art, independent of utilitarian and engineering purposes" (Pyatok, 2014). Nevertheless, there was a loss of contribution from the master craftsman in the design process.

But the absence of the master builder from the design process did not last too long. Walter Gropius (1883-1969) eventually advocated for the process of making things, a piece of furniture or a building that: "Artists, let us at last break down the walls erected by our deforming academic training between the 'arts' and all of us become builders again! Let us together will, think out, create the new idea of 55 architecture" (Butko and Cricchio, 2014: 501) in the curriculum of the Bauhaus (School of Building). The Bauhaus reclaimed the act of making within the design process. By reintroducing the role of an architect as a master builder and collaborating with craftsmen, the utilitarian

and worker class quality were brought back into the design practices in Europe and introduced into the United States during the 1940s (Wilmes, 2015).

Influenced by William Ware, Frank Lloyd Wright and Paolo Soleri created another two education platforms, Tailesen West in 1937 and Atcosanti in 1970. The students build to learn and learn to build.

According to Butko and Cricchio (2014: 501): “the best architects understand the logic and poetics of construction, and the best way to teach this is to build”. Inspired from Taliesen West and Arcosanti, the design-build studio came into being to combine the two roles of an architect, acting as both builder and designer. The design-build studio supports the thoughts that building, making and designing reinforces and illuminates each other, in other words, thinking through making and making through thinking. Most of the design-build studios focus on providing architectural solutions to social problems, aiding people and communities in need (Stonorov et al., 2018). A strong spine in design and construction studio facilities is designing and building construction techniques that may guide the design process. In other words, the impetus of the design-build studio is the willingness of students to work in cooperation and help people in need (Wilmes, 2015). As demonstrated in the project Laufen Manifesto for Humane Design Culture: “Designers are not trained sufficiently to achieve positive change for people living in underserving conditions. Design education has to evolve radically to ensure young designers have the capacity to bridge the gap between design and construction,

understand the nuances of diverse sites and territories, and communicate more profoundly with local communities and stakeholders. In short, instill a greater social empathy. Manual skills must be developed on the same footing as digital and intellectual skills. Designing the right process must be equally important as the outcome" (Studio Anna Heringer, 2013). There is the opportunity for students to interact in person with clients who have specific needs, which promotes accountability in a way that a traditional studio setting does not (Stonorov et al., 2018).

There are typically two types of design-build projects: fast build projects and long build projects. The fast design-build projects can come across into any traditional academic semester without disturbing the normal semester due to its fast timeframe. However, the longer projects can have a deeper impact on the society because the deeper considerations of design concepts, construction methods and public involvements (Stonorov et al., 2018). Because the variation of scale and time arrangement, design-build studios allow students to achieve their design concepts and address materials, construction and function, from a small scale to global level (Butko and Cricchio, 2014).

The first design-build attempt to "shift architecture education from an emphasis on shape elaboration toward a concern for usefulness" was the First Year Building Project founded by Charles Moore at Yale in 1967 (Hayes, 2007). It was the first time to give architecture pupils a platform to build what they designed. Students learned the skills of architecture by dedicating themselves to their local communities (Galarza, 2018).

Later, more design-build studios came out. Take Rural Studio for example, students live off-campus, designing and constructing their own house to sleep and study, in which their educational experiences come across with design, construction and community. Rural Studio was eventually succussed with its mission "to serve the underserved in one of the poorest regions of the country" (Wilmes, 2015:28).

2.1.7 Community Design Centres

Around the same time with the first design and build studio was founded, the first Community Design Centres (CDCs), for example, the Architect's Renewal Committee in Harlem (ARCH) founded in 1964 came to life. The aim of ARCH is to serve residents who were suffering problems of displacement resulted by state-led redevelopment projects (Galarza, 2018). Community Design Centres (CDCs) like the Architect's Renewal Committee in Harlem (ARCH) helped "to shape a physical vision of a neighbourhood that was produced by its low-income residents and whose redevelopment would serve their needs for community-controlled education, social services, affordable housing, political activism, and cultural experimentation" (Goldstein, 2013:22).

The American Institute of Architects, which was founded in 1857, established certain ethical guidelines for the design industry, where construction services were prohibited from being performed by design professionals. The AIA lifted the prohibition on a single firm acting as both designer and builder in 1978, with contract literature

developed to reflect this new project delivery method (AIA, 2009). The idea of Community Design Centres was initially generated from the speech of Whitney Young in the 1968 AIA convention for the poor contribution of architectural design to address social problems of American cities. Architects then noticed the opportunities of advocacy-based architectural design and began to use architecture schools as a platform to serve the underserved (Wilmes, 2015). According to the Association for Community Design (ACD) (2014), community-based design is known as a "movement" that encourages and drives the development and growth of environments that serve people. It encourages change on a neighbourhood, city, regional, and even national scale, and works to meet community needs by allowing people to shape the built environment in partnership with one another. These Community Design Centres have been proven to be an effective vehicle for offering a broad range of community development services (ACD, 2014). David Perkes also suggests in the 2011 Latrobe Prize report that "Community design centres often have an important role to bridge between people in a neighbourhood, institutional stakeholders and city leadership, largely to achieve equity in design decisions" (Bell, Feldman, Palleroni & Perkes, 2013: 10). "Refining designs with community partners solidifies partnerships and enhances design, creating usable projects that reflect nonmaterial culture" (Anderson, 2014: 403).

"Reflecting on Service-learning in Architecture," "the typical public interest design studio or community design centre is formatted to reflect the structure of professional practice. Most community design centres must run like an architecture firm to function properly due to the use of grant funding" (Gregory and Heiselt, 2014: 404). By changing

from the highly defined creation of objects to a dynamic process for attaining change and impact, humanitarian design broadens the profession and education of architecture and design (Anderson, 2014).

2.1.8 How do Current Humanitarian Architecture Practices Operate?

Generally, there are basically two operating systems for service of humanitarian architecture: for-profit practices and non-profit practices.

The for-profit practices are divided into two types: for-profit practices with public pro bono services provide between 1% to 10% of their work free of charge and for-profit integrated practices provide work with delayed or reduced payment, and sometimes engage in pro bono work.

While the non-profit practices are divided into three types: independent non-profit corporations, university-based programs and foundation initiatives. Independent non-profit corporations provide more funding sources and range of projects than for-profit practices, which allows funding from government, organizations and individual donors to solve humanitarian problems, such as natural disasters and social crises (Bell et al., 2013). Grants from government-funded programmes are distributed to states or municipalities rather than to individuals (HUD, 2014). However, in some cases, government-funded systems and private financial systems can work together creatively. Private funding can take the form of sponsorships, private partnerships, or donations

made by charitable institutions and other types of foundations established in the public interest. These can take the form of academic grants or partnerships between an institution like that and a non-profit organisation at the collegiate level (Wilmes, 2015).

"Specific to public interest projects, there is an added stigma related to the potential for embezzlement or misuse of funds, as well as the perception that tax dollars are involved whether this is the case or not" (Elliott and Kemp, 2014: 415). Take Public Architecture for example, which is a not-for-profit national 501(c)(3) charitable organization based in San Francisco, CA. A tax-exempt educational non-profit corporation is commonly referred to as a 501(c)(3). (IRS, 2013). To qualify as a 501(c)(3), an organisation must have a clearly defined set of charitable objectives (Wilmes, 2015). Public Architecture "puts the resources of architecture at the service of the public interest" (Peterson, 2008:96). Peterson has also established the program of '1% Pledge' in which architects should advocate at least 1 per cent of their billable hours to work in the public realm for free through Public Architecture (Wilmes, 2015).

In terms of the delivery mechanisms behind both for-profit practices and non-profit practices, code-related requirements, funding opportunities, local labour requirements, design review processes, legal issues related to land acquisition, and simple zoning requirements are some of the mechanisms underlying the process (Wilmes, 2015).

Following is an incomplete summary of list of humanitarian agencies and people work in humanitarian architecture field:

- Ahmedabad Study Action Group (ASAG)
- Asian Coalition for Housing Rights (ACHR)
- Architects without Frontiers (AWF)
- Architecture and Development (A&D)
- Architecture for Humanity (AFH)
- Architecture Sans Frontieres (ASF)
- Centre for Development and Emergency Practice (CENDEP)
- The Clinton Foundation
- Community Architects for Shelter and Environment (CASE)
- Cooper-Hewitt Design and Social Impact Summit
- Cordaid (Catholic Organisation for Relief and Development Aid)
- Design Corps
- Development Planning Unit, University College London
- DFOD (Department for International Development)
- Down detour road: An architect in search of practice
- Emergency Architects
- Emergency Architecture Australia
- Engineers Without Borders Australia (EWB)
- GHESKIO (Haitian Group for the Study of Kaposu's Sarcoma and Opportunistic Infections)
- Guff Coast Community Design Studio (GCCDS)
- Habitat for Humanity
- Haiti Center
- International Federation of Red Cross and Red Crescent Societies (IFRC)
- InterTect
- John Cary

- John F.C. Tuner
- Make It Right
- MASS Design Group
- Master of International Cooperation: Sustainable Emergency Architecture
- Mecanno
- Medcins Sans Frontieres (MSF, Doctors without Borders)
- Nabeel Hamdi
- Open Architecture Network
- Participatory Development Programme in Urban Areas (PDP)
- Partners in Health (PIH)
- Project H
- Public Architecture
- Publicinterestdesign.org
- RedR Australia
- Rural Studio
- Shelter after disaster
- The Shelter Centre
- The Sphere Project
- Stefan Behnisch Architects (Behnisch Architekten)
- UN-Habitat
- Urban-Think Tank (U-TT)
- Voluntary Architects' Network (VAN)
- World Vision International
- WorldChanging

2.2 The Research Opportunity: The Chinese Context

In the last ten years, due to the fragile rural environment in China and frequent unexpected natural disasters, there have been many 'humanitarian' projects developed to respond to the need for 'post-disaster reconstruction' (Zeng and Huang, 2015). As a result, and similar to the global picture, research into post-disaster humanitarian architecture has increased significantly, however, research into 'non-disaster relief' projects focused on socio-economic development is rare. This research therefore focuses upon humanitarian architecture, such as school projects, that serves under-developed communities.

The rapidly developing economy in China has resulted in the gap between rich and poor becoming wider particularly in relation to the standard of education and school facilities between urban and rural areas (Fan and Tanoue, 2015). This situation has particularly affected migrant workers, who are the products of the unique urban-rural system in China. This has resulted in a special social group emerging whereby many migrant workers move to cities for employment opportunities leaving their rural 'left-behind children' in their home towns or villages. It is shown in the "China Child Welfare and Protection Policy Report 2019" that until the end of August 2018, there were 6.97 million left-behind children in rural areas across the country. In terms of regional distribution, the number of rural left-behind children in Sichuan are the largest with 765,000, followed by Anhui, Hunan, Henan, Jiangxi, Hubei and Guizhou. The total

number of left-behind children in rural areas in the above seven provinces is 4.844 million, accounting for 69.5% of the country's total. From the perspective of guardianship, 96% of rural left-behind children are taken care of by grandparents or grandparents across generations, and the remaining 4% are taken care of by other relatives and friends (BJNews, 2019). The age group of left-behind children in rural areas is defined by law as under 16 years old. This section will define "humanitarian architecture" in the Chinese context and investigate how humanitarian architectural projects are fulfilled within its cultural background.

2.2.1 Defining "Humanitarian Architecture" in the Chinese Context

Humanitarian architecture has been undertaken in China, however, for cultural reasons this has not been under the 'humanitarian' banner. Indeed, the term 'humanitarian architecture' is not recognized by the Chinese architectural community and similar descriptions tend to refer to "architects involved in the humanitarian field" or "an architect with a humanitarian spirit". As such, humanitarian architecture within China is typically known as "charitable public welfare architecture" with "humanitarian" efforts considered to belong to less developed countries.

The development of "Humanitarian architecture" in China is still in progress. In recent years particularly, the number of architects involved in humanitarian architecture has raised, architectural practice in the countryside has become a social trend in contemporary Chinese architecture. The translation of "humanitarian architecture" in

Chinese is “humanitarian” “architecture”, however, there is no abject of “humanitarian” “architecture”, in the Chinese architectural dictionary, the most often descriptions in Chinese to describe humanitarian architecture is “architects involved in the humanitarian field” or “the architect has a humanitarian spirit”. Humanitarian architecture is typically known as “charitable public welfare architecture” within Chinese context. In fact, when talking about the subject of the direct translation of humanitarian architecture “humanitarian” “architecture”, it always means the architectural welfare projects that China has introduced to assist other disadvantaged countries. Suggested definition of humanitarian architecture in the context of China is public welfare architectural projects provided for disadvantaged communities, which could be charitable, or government funded.

Although the research on non-disaster relief humanitarian architecture is not enough, there are still many humanitarian school buildings with the characteristics of freedom and diversity have been designed in rural areas of China to serve the underserved villagers. The constructions fees of these schools are normally donated by NGOs, private donors, businesses, foundations and sometimes by architects themselves. During the design and construction process, the funds are dominated and managed by the architectural design team (Fan and Tanoues, 2015).

2.2.2 Typologies of Humanitarian Architecture Practices in China

In China, humanitarian school projects are not only provided for reconstruction after natural disasters, but also focus on school projects with social awareness, which are typically provided to those in the rural areas or disadvantaged communities with the cities. In terms of project initiation process of humanitarian schools in China, there are basically five categories: government-initiated projects, NGO-initiated projects, private architectural practice-initiated projects, higher education institution-initiated projects and company-initiated projects. However, they may come across to complete the projects.

- **Government-initiated Projects:**

The government has launched several poverty projects to address educational problems in rural China, such as New rural construction, Rural boarding school construction project, Rural primary and secondary school renovation project, Basic universal nine-year compulsory education and basic eradication of young and middle-aged illiteracy, Action plan for education for the 21st century, etc. Based on these projects, there are numbers of school construction projects to improve the education environment in the rural areas. Apart from these, there are other school construction projects under the government policies as well, where the government initiated and sponsored for the projects.

New rural construction

In recent years, the construction of new rural areas has continued to increase. In order to better construct the new rural community and effectively improve the living environment and rural style, architects need to use professional knowledge to contribute to the development of rural areas. In the process of extensive urbanization, the transfer of a large number of agricultural populations has left some traditional villages in a state of aging and empty nesting. Especially those remote villages that are restricted by the location and transportation conditions and the socio-economic level are suffering from development difficulties. In the context of the continuous advancement of New rural construction, the speed of village construction in rural China is increasing at a relatively rapid rate, which is extremely important for the development of the rural economy and the improvement of the quality of life of residents (Zheng, 2021).

Rural boarding school construction project

Vigorously promoting the development of rural education is a basic requirement for the New rural construction and an important requirement for the balanced development of education.

In some rural areas of China, commencing in the mid- to late-1990s, school administrators have begun to make appropriate changes to the layout of primary and secondary schools. Since the twenty-first century, the government issued the "Decision

on the Reform and Development of Basic Education," which calls for "adjusting the layout of rural compulsory education in accordance with local conditions, according to the principle of enrolling in the nearest elementary school, relatively concentrated junior high schools, optimizing the allocation of educational resources" in rural areas. As a result, a new round of structural adjustments to the layout of rural primary and secondary schools in China has been carried out nationwide, taking advantage of the opportunity presented by the reformation of rural education resources allocation, with the goal of increasing the scale of running schools while simultaneously improving the efficiency of operating schools (Zhang, 2010).

Because of the rapid changes in China's economic and social development situation in recent years, the problems caused by the irrational distribution of education have become even more prominent in the country's vast rural areas, where they have been for decades. Small school sizes and dispersed teaching sites in China's vast rural areas have resulted in the dispersion of educational resources, raising the cost of education, and posing a serious barrier to the achievement of balanced educational development and the development of a new countryside. As a result, boarding schools that can not only make it easier for children to go to school but also take into consideration the quality of education provided have emerged as the most effective approach of addressing the issue (Zhang, 2010). Therefore, the government initiated and invested in the construction of a series of boarding schools.

Rural primary and secondary school renovation project

According to "Implementation Plan of the National Development and Reform Commission, the Ministry of Education, and the Ministry of Finance on the Reconstruction Project of Dilapidated Houses in Rural Primary and Secondary Schools", the renovation project of rural primary and secondary schools is a special fund allocated by the central government since 2003 to support the local government in completing the task of renovating the existing D-class dilapidated houses in rural primary and secondary schools. The goal is to establish and improve a new mechanism for investment in the construction of rural compulsory education facilities, and to transform the existing B- and C-level dilapidated houses in rural primary and secondary schools and the newly generated dilapidated houses in the future. The local government is responsible for checking, making plans, implementing funds and assuming the responsibility for renovation. The project schools involved must be elementary schools, junior schools, and complete junior schools, including its high schools in the rural compulsory education stage organized by the government, as well as special education schools at the corresponding stage.

- **NGO-initiated Projects:**

Generally, public welfare projects in China need to get financial allocation from the government. Preliminary design, construction design and construction should run after approval for the feasibility study from the government departments (Deng and Wu,

2006:57). The NGOs participation in poverty alleviation in China is bound to require government supports and must cooperate with local governments, however, most of the previous cooperation was on the lower level of cooperation and lacked overall planning, the poverty alleviation resources in some impoverished areas have not been effectively integrated. For example, a few poor areas have not only poverty alleviation projects by government poverty alleviation offices, but also poverty alleviation projects of INGOs or local NGOs, which has caused a serious waste of resources (Deng and Wu, 2006:57).

There are several popular humanitarian projects initiated by NGOs in China, for example, Project Hope by China Youth Development Foundation (CYDF), Nesting Action Project by China Foundation for Poverty Alleviation (CFPA), Spring Bud Program, Spring Bud Plan, Spring Budding Boarding School by China Children and Teenagers' Fund (CCTF).

Project Hope by China Youth Development Foundation (CYDF)

Project Hope is one of the most well-known and widely participated philanthropic programs in China. It is a non-profit program launched by the China Youth Development Foundation (CYDF) in October 1989 to serve the social welfare undertakings for the development of young people in China. Its two major public welfare projects are the construction of Hope Primary Schools and the financing of poor students. Based on government's guideline of raising funds for education through multiple channels, Project Hope extensively mobilizes social resources to establish the

capital and conditions for the transformation, establishment, and operation of rural primary schools for children aged from 6 to 12 to help local out-of-school children complete their studies, ensure the appropriate age children receive compulsory education and promote the development of basic education in underdeveloped rural areas.

Hope Primary School is an important way to improve the conditions of schools in poor areas. According to "'Two exemptions and one subsidy' and hope project demand research report" in 2005 by China Youth Development Foundation, 86.7% of the surveyed education department heads and principals considered that school building is the most need for rural educational funding project, 70.0% of teachers hold the same opinion (Shanghai Youth Development Foundation, 2005).

At present, hope primary schools are mainly one-time construction. The hope primary school constructions funds require both the local government and donor funding. The proportion of funds required for the construction of a desired primary school is 50% for both the donor and the local government and 10% of the donor's funding will serve as the services, management, and administrative costs of the China Youth Foundation. Once the government funds in place, then the donor funds. Construction funds is not a one-time payment, but prepaid. After the completion of the project, the audit and engineering quality inspection will be carried and then the remaining money will be made up.

Due to the limited capacity of the China Youth Development Foundation, after the completion of the construction of hope primary schools, series including arrangement of teachers, equipment and other management matters need to be completed by the government and other relevant departments. The county-level people's government, as the beneficiary representative, assumes responsibility for the management of the construction of hope primary schools including planning, design, progress, capital, quality and construction safety. The beneficiary counties should set up the hope primary school construction leading group after the establishment of the hope primary school aid project. The members include the county people's government, relevant officials of the Education Bureau and the Communist Youth League. County-level people's government needs to provide the hope primary school construction management funds to county-level Youth League, which should be no less than 2% of the donation. Funding for the management work should not be from Hope Primary School donations.

The designers for the Hope Primary School projects are not only the in-house architects from the CYDF but also sometimes to be the architects from public. The approach for the public architects involves in the design of the Hope Primary School projects are multiple, for example, paid architects, voluntary architects, student competition and student voluntary practice, etc.

Nesting Action Project by China Foundation for Poverty Alleviation (CFPA)

The China Foundation for Poverty Alleviation (CFPA) officially launched the "Nest Building Action" project in October 2011, which aims to build student dormitories for rural primary schools in impoverished areas and support for poor students. According to CFPA (2021), at the end of 2016, the project pledged more than 120 million yuan, and 220 school dormitories have been built in 206 counties in 18 provinces across the country, benefiting about 93,000 children.

Spring Bud Program, Spring Bud Plan, Spring Budding Boarding School by China Children and Teenagers' Fund (CCTF)

In 1989, under the leadership of the All-China Women's Federation, the China Children and Teenagers' Fund（CCTF）initiated and implemented the "Spring Bud Program" charity project dedicated to improving the education of girls from poor families. The project focused on girls' education, girls' safety, girls' health, etc., and carried out various forms of funding services for a large number of girls. The "girls" identified by the "Spring Bud Project" generally refer to preschool girls and female students in elementary, middle, and university stages.

To further deepen the care and service work for left-behind children and explore effective models for caring for left-behind children in rural areas and communities, the All-China Women's Federation and China Children and Teenagers' Fund jointly launched the "Children's Happy Home" charity project in 2004. The "Children's Happy

Homes" project aims to provide care services, family education guidance, psychological consultation and other services for left-behind children in rural towns and villages and at the same time, to develop a series of family activities, such as “parent-child videos”, “parent-child classrooms”, “parent-child reading”, and “parent-child Games” are used to enhance family communication, strengthen the publicity and popularization of family education and scientific knowledge, and optimize the family and social environment in which left-behind children grow up.

Since 2005, with the promulgation of the revised "Compulsory Education Law" and the implementation of the national "two exemptions and one subsidy" education policy, the China Children and Teenagers' Fund（CCTF）has adjusted the funding focus of the "Spring Bud Program", the scope of assistance has been expanded from elementary and junior high school to high school and even university. In addition, according to the fact that a large number of rural laborers have moved to cities, resulted in the status of "left-behind children" and "migrant children" appeared in rural areas, the "Spring Bud Program" has extended the focus of attention to "left-behind children" and "migrant children" and launched the "Spring Bud Boarding School" project.

In September 2019, the China Children and Teenagers' Fund launched the "Spring Bud Project-Dreaming the Future" action as an upgraded version of the "Spring Bud Project". The school dream realization project focusing on girls' education, the social practice project based on the research of girls, the safety and health project focusing on the

protection of girls, and the together growth project in the form of pairing assistance for girls, and so on have been carried out under the "Spring Bud Project-Dreaming the Future" action.

- **Private Architectural Practice-initiated Projects:**

In recent years, with the strategy of rejuvenating the country through science and education, respecting for talent, and paying attention to education have become the consensus of society. However, the reality is that the proportion of children out of school in rural areas increased year by year and especially the younger age.

Architects who concern the basic education issues have organized donations through their own resources and get more resources to help rural primary schools that cannot be extended due to poor school buildings. Architects want to do their best to provide the children with a better learning environment, to ensure their successful completion of their studies. The route of private architectural practices involve in humanitarian architecture can be grouped into three types. The first option is for a private architectural firm to initiate, invest in, and design the project. The second method is for private architectural firms to participate in government-sponsored projects, usually by lowering design costs. Another way for a private architectural practice to participate in humanitarian architectural projects is to work with NGOs as a professional partner in the architecture field.

- **Company-initiated Projects:**

There are also company-initiated humanitarian architectural projects in China in both disaster-relief humanitarian projects and non-disaster relief humanitarian projects. Usually, the companies sponsored for the projects and engage the architectural services of an architectural agency, where donations will be made through charities or government agencies.

According to the Article 9 of the revised Chinese Corporate Income Tax Law, the portion of the public welfare donation incurred by the company, which is within 12% of the total annual profit, is allowed to be deducted when calculating the taxable income; if it exceeds 12% of the total annual profit, the grant is granted and to be deducted from the calculation of taxable income within three years after the carry-over (XINHUANET, 2017).

Conclusion

This chapter detailed the research background of the study, from the international to the specific Chinese context. From the global image, the definitions of humanitarian architecture have been discussed, and the history of humanitarian architecture has been examined in order to evaluate humanitarian architecture, as well as the arguments on humanitarian architecture throughout history and how current humanitarian architecture projects are working. Key points summarized:

1. Although humanitarian architecture is basically architecture designed for people in need, the definition of humanitarian architecture is constantly changing by tracking the history. Within the first two decades of the twenty-first century, the subject of "humanitarian architecture" has risen, and it goes by many names, including "public interest design," "community design," "design for the underserved," "design for the broader good," "pro bono design," "socially conscious, socially just, and socially aware design," and "asset- and needs-based design."

2. Since the 1970s, a large number of international non-governmental organisations and non-profit organisations have been working on humanitarian architecture.

3. However, when it comes to the twenty-first century, the challenges have yet to be resolved completely. In general, the living conditions of the poor have not significantly improved, the potential of humanitarian architecture has remained largely untapped, and the training of younger professions has remained insufficient.

4. Since the 2014 Indian Ocean tsunami, the role and responsibility of architects and the efficiency of humanitarian architecture have begun to be argued.

5. Architects active in humanitarian architecture can be split into three categories: private practice-based architects, university-based architects, and non-government organization/international aid-based architects.

6. Design-Build Studios and Community Design Centres play an essential role in the practices of humanitarian architecture.

7. In general, there are two operating systems for providing humanitarian architecture services: for-profit and non-profit. For-profit practises are classified into two categories: for-profit practises with public pro bono services provide between 1% and 10% of their work for free, and for-profit integrated practises provide work with delayed or reduced payment and occasionally engage in pro bono work. Non-profit organisations are classified into three types: independent non-profit corporations, university-based programmes, and foundation initiatives.

In terms of the Chinese context, humanitarian architecture with Chinese characters has been discussed to investigate the research possibility. Key findings involved:

1. Similar to the global picture, research into post-disaster humanitarian architecture has increased significantly, nevertheless, research into ‘non-disaster relief' projects that focus on socio-economic development is still in its early stages.

2. Humanitarian architecture has been undertaken in China, but not under the banner of ‘humanitarian' architecture due to cultural reasons. Indeed, the Chinese architectural community does not recognise the term "humanitarian architecture," and corresponding descriptions tend to refer to "architects engaged in the humanitarian field" or "an architect with a humanitarian spirit."

3. Humanitarian architecture is commonly referred to in China as "charitable public welfare architecture," with "humanitarian" initiatives being associated with less developed countries.

4. Suggested definition of humanitarian architecture in the context of China is public welfare architectural projects provided for disadvantaged communities, which could be charitable, or government funded.

5. Humanitarian school projects in China are not only provided for reconstruction after natural disasters, but also focus on school projects with social awareness, which are typically provided to those in the rural areas or disadvantaged communities within the cities.

6. In terms of project initiation process of humanitarian schools in China, there are basically five categories: government-initiated projects, NGO-initiated projects, private architectural practice-initiated projects, higher education institution-initiated projects and company-initiated projects. These routes could get crossed when complete a project.

As the research background and research possibilities have been introduced in this chapter, the next chapter will talk about the research methodology going to be used to address the research needs.

Chapter 3: Research Methodology: Research Methods and Data Collection

Introduction

This chapter will discuss the research methods that going to be used in this research in terms of their advantages and disadvantages and how to apply these research methods into the actual case study data collection. In addition, the research design, structure, and process will be clearly introduced.

3.1 Research Approach: Relations between Theoretical Background and Empirical Research

Methodology is a key strategy of a PhD research project. As clarified in the beginning of the thesis, the aim of this research project is to understand and improve the process of humanitarian architecture in China in related to the provision of schools for disadvantaged communities. To achieve this, there are four key research questions generated. To answer these key research questions revolves around the process of humanitarian architecture in the provision of schools in disadvantaged areas in China, this PhD research adopts qualitative research methodology. Case studies will be the main research method for this research with sub-research methods including literature

review, interviews, focus groups and participant observation. This section will discuss the selected research methods that going to be used in this research.

3.1.1 Literature review of selected research methods

"We ask open-ended research questions…, Shaping the questions after we explore…. Our questions change during the process of research to reflect an increased understanding of the problem."

- Creswell (2007: 43)

The research methodology adopted of this PhD project is qualitative research. Denzin and Lincoln (1994: 02) define qualitative research as a "multi-method in focus, involving an interpretive, naturalistic approach to its subject matter." There are five key characteristics of qualitative research: it sits on natural settings, focuses on interpretation and meaning, how to make sense of respondents' own situation, uses multiple tactics and has significant inductive logic. Apart from these typical characteristics, there are also other aspects of qualitative research methodology, such as holistic, prolonged contact, open-endedness, researcher as measurement device, analysis through words or visual material and personal or informal writing stance (Groat and Wang, 2002).

Qualitative research can be defined as having three main components. The first step in analysing information is to identify the various sources such as interviews,

observations, documentation, records, films. Another thing to note is that researchers can use various procedures to help them interpret and organise the data. The third part of the project is written and verbal reports (Corbin and Strauss, 2014). Data collection, data analysis, data interpretation, and data reporting commonly take place simultaneously during qualitative research, and the results of one process can guide the others (Brown, Iacono and Holtham, 2009).

Ethnography, action research, biography, grounded theory, phenomenology, and case study are six major traditions of qualitative research. This research will adopt case study approach as the main research method, which is followed by sub-approaches of literature review, interviews, focus groups and observation.

The following table shows the variety of data sources for qualitative research (Groat and Wang, 2002:244): "Sources from: Linda Groat and David Wang, *Architectural Research Methods* (New York, NY: Wiley & Sons, Inc. 2002); and John W. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (Thousand Oaks, CA: SAGE, 2009)."

Tactics	**Interactive**	**Noninteractive**
Interviews & Open-Ended Response Formats	• Face to face or phone, • In-depth interviews, • Focus groups, • Task-oriented formats, e.g.: mapping exercises, multiple sorting task, projective surveys (games)	• Online response to open-ended questions • Prompted journaling • Activity logs • Photo logs
Observations	• Participant observation (research role concealed) • Participant observation (research role known)	• Nonparticipant observation
Artifacts and Sites	• *In situ* observation & analysis of artifacts/ buildings/urban context/landscape sites	• Photos, drawings, or virtual representations of artifacts and sites
Archival Documents		• Public documents • Audio visual material • Artefactual or site documentation • Personal journals, diaries, letters, sketches

Table 4. The variety of data sources for qualitative research (Groat and Wang, 2002:244)

Observation is often used to understand subcultures with asking both 'what' and 'how' questions. Texts and documentation are background materials to understand language and other sign systems. While interviews are used to understand experience with

narrative construction (Silverman, 2013). Although different research methods are used for different intentions to gain the data, however, sometimes it makes sense to combine different methods to get a comprehensive information image.

- **Case Study**

A case study examines the facts of the situation, instead of attempting to draw general conclusions (Thomas, 2015). By using case study, researchers could understand a phenomenon in its natural context (Brown, Iacono and Holtham, 2009). Yin (1984: 23) defined the case study as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used." A case study is particularly useful to understand a particular situation in depth, as Feagin, Orum and Sjoberg (1991) describe that case study is preferred specially to deal with a holistic and in-depth investigation. In most cases, case studies are dedicated to a certain area or group of people (Zainal, 2007). According to Stake (2000:436): "A case may be simple or complex…(but) it is one among others. In any given study, we will concentrate on the one". The main concept behind this is that, in some situations, one or a few cases will be studied in depth, with whatever methods appear relevant. The general objective is to gather as much information as possible about that case (Punch, 1998).

The categories of case study are various. Yin (1984) identifies three categories of case study, including exploratory case studies, descriptive case studies and explanatory case studies. McDonough and McDonough (1997) distinguish two other categories of case study, which are interpretive case studies and evaluative case studies, while Stake (1995) indicates three different types of case study, namely intrinsic, instrumental and collective case studies. Although there are different types of case studies, all of them can be applied by either single-case or multiple-case procedures (Tellis, 1997).

Case study enables researchers to examine the data within its real-life context and at the micro level (Zainal, 2007). But due to its small size of sampling, it is often criticized as lacking rigour and providing little basis to address the issues of generalisability (Johnson, 1994). However, Hamel, Dufour and Fortin (1993) and Yin (1994) argue that compared with a big size sampling, parameter establishment and objective setting of the research are much more important. The purpose of case studies, according to Anderson (1993), is to investigate how and why things happen, as well as the differences between what was planned and what actually happened.

Yin (1994) points out six types of evidence of data sources for case study, including documentation, archival records, interviews, direct observation, participant observation and physical artifacts. In this research, documentation, interviews and participant observation are preferred research methods. However, documentation in this research

mainly focuses on literature review. In addition, focus groups are used parallel with interviews.

Simons defines case study as "an in-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, institution, program or system in a 'real life' context" (Simons, 2009: 21). Thomas (2011) emphasizes on Simon's definition of case study that it is not a method itself, but a design frame that may incorporate other research methods. Similarly, Stake (2005: 443) clarifies that "Case study is not a methodological choice but a choice of what is to be studied.... By whatever methods we choose to study the case. We could study it analytically or holistically, entirely by repeated measures or hermeneutically, organically or culturally, and by mixed methods—but we concentrate, at least for the time being, on the case."

"What is a case? Comparative social science has a ready-made, conventionalized answer to this question: Boundaries around places and time periods define cases (e.g., Italy after World War II)", emphasised by Ragin (1992:05).

Similarly, Thomas (2011) suggests that a case study should comprise two elements: a "practical, historical unity," which is the *subject* of the case study, and an analytical or theoretical frame, which is the *object* of the study. In addition, Thomas (2011: 513) developed the definition of case studies to be "analyses of persons, events, decisions, periods, projects, policies, institutions, or other systems that are studied holistically by

one or more methods. The case that is the subject of the inquiry will be an instance of a class of phenomena that provides an analytical frame - an object - within which the study is conducted, and which the case illuminates and explicates".

In terms of the subject selection, Yin (2009: 48) suggests that a case may be selected when it is "representative and typical". However, Thomas (2010; 2011; 2012) disagreed with Yin and argued that "the notion of typicality may give an unwarranted impression to any reader that the significance of the analysis rests in the representativeness of the subject. It does not". In short, there are three potential selections of the subject: a local knowledge case, a key case and an outlier case (Bates et al., 1998). The content of a local knowledge case will be relevant to practitioners and students who are doing research, of "the actors, the decision points they faced, the choices they made, the paths taken and shunned, and the manner in which their choices generated events and outcomes" Bates et al. (1998: 13-14). The subject of a key case may come to the forefront as a matter of fact of the inherent interest of the case. As for an outlier case, the object may be illustrated by its virtue differences and outlier status. Thomas (2015:04) summarized that: "the main feature of your choice of case will be the interest that you have in the subject of the study: You are intimately connected with it; It is a conspicuously good example of something in which you are interested; It is different from what is typical."

To make the decision, there are two primary approaches. Considering if it is a knowledge case first as it would be a ready-made advantage for conducting a case study if the researcher is familiar with the case. Then the second approach comes into mind if the study is not taken because of local knowledge, it's a key study with particular interest or an outlier case because it is special and different with other cases (Thomas, 2015).

According to Wieviorka (1992:160), "For a 'case' to exist, we must be able to identify a characteristic unit…. This unit must be observed, but it has no meaning in itself. It is significant only if an observer…can refer it to an analytical category or theory. It does not suffice to observe a social phenomenon, historical event, or set of behaviors in order to declare them to be 'cases.' If you want to talk about a "case," you also need the means of interpreting it or placing it in a context". Therefore, the subject should be considered within an object. "Regardless of the practical approach for studying it, a case is an opportunity of relating facts and concepts, reality and hypotheses. But do not make the mistake of thinking that it is, in itself, a concept" Wieviorka (1992:160).

Table 5 presents different kinds of cases studies that listed by different analysts:

George and Bennett (2005, drawing on Eckstein, 1975)	Merriam (1988)	Stake (1995)	Bassey (1999)	de Vaus (2001)	Mitchell (2006) (drawing on Eckstein, 1975)	Yin (2009)
Theory testing	Descriptive	Intrinsic	Theory seeking	Descriptive/ explanatory	Illustrative	Critical
Atheoretical/ configurative-idiographic	Interpretative	Instrumental	Theory testing	Theory testing/ theory building	Social analytic	Extreme/ unique
Disciplined configurative	Evaluative	Single/ collective	Storytelling	Single/multiple case	Extended (over time)	Longitudinal
Heuristic	—	—	Picture drawing	Holistic/embedded	Configurative-idiographic	Representative
Plausibility probes	—	—	Evaluative	Parallel/sequential	Disciplined-configurative	Revelatory
"Building block" studies	—	—	—	Retrospective/ prospective	Heuristic	—
					Plausibility probes	

Table 5. Kinds of Case Studies, as Enumerated by Different Analysts (Thomas, 2011: 516)

Table 6 presents a simplified classification of case studies:

Subject	Purpose	Approach	Process	
Special or outlier case Key case Local Knowledge case	Intrinsic Instrumental Evaluative Explanatory Exploratory	Testing a theory Building a theory Drawing a picture, illustrative Descriptive Experimental	Single or multiple	Nested Parallel Sequential Retrospective Snapshot diachronic

Table 6. Simplified classification of case studies (Thomas, 2015)

Table 7 illustrates the typology of case study:

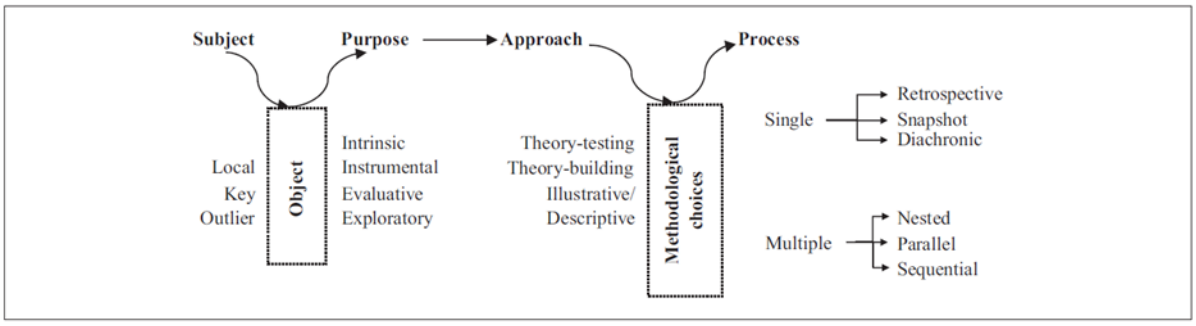

Table 7. A typology of case study (Thomas, 2011:518)

Single studies, which do not include a comparison element, will primarily take one of three forms, in which the personal or systemic characteristics of the subject are in some way bound by time. In terms of the multiply studies, there are more subdivisions between parallel study and sequential study including nested study, retrospective study, snapshot study and diachronic study. The parallel study looks at cases that are happening and being studied at the same time. In contrast, the sequential study examines cases that happen sequentially, and there is a supposition that what happened in the past, whether or not it was an intervening period, has some influence on the following cases (Thomas, 2011).

According to Yin (2003), a case study design should be considered when the following conditions exist: (a) the objective of the study is to answer "how" and "why" questions; (b) the participants behaviour of the study cannot be manipulated; (c) the contextual conditions are wished to be covered because they are believed to be relevant to the phenomenon under study; or (d) the boundaries between the phenomenon and context

are unclear. Baxter and Jack (2008) have summarized the definitions of different types of case studies:

Case Study Type	**Definition**
Explanatory case study	This type of case study would be used if you were seeking to answer a question that sought to explain the presumed causal links in real-life interventions that are too complex for the survey or experimental strategies. In evaluation language, the explanations would link program implementation with program effects (Yin, 2003).
Exploratory case study	This type of case study is used to explore those situations in which the intervention being evaluated has no clear, single set of outcomes (Yin, 2003).
Descriptive case study	This type of case study is used to describe an intervention or phenomenon and the real-life context in which it occurred (Yin, 2003).
Multiple-case studies	A multiple case study enables the researcher to explore differences within and between cases. The goal is to replicate findings across cases. Because comparisons will be drawn, it is imperative that the cases are chosen carefully so that the researcher can predict similar results across cases, or predict contrasting results based on a theory (Yin, 2003).

Intrinsic case study	Stake (1995) uses the term intrinsic and suggests that researchers who have a genuine interest in the case should use this approach when the intent is to better understand the case. It is not undertaken primarily because the case represents other cases or because it illustrates a particular trait or problem, but because in all its particularity and ordinariness, the case itself is of interest. The purpose is NOT to come to understand some abstract construct or generic phenomenon. The purpose is NOT to build theory (although that is an option; Stake, 1995).
Instrumental case study	Is used to accomplish something other than understanding a particular situation. It provides insight into an issue or helps to refine a theory. The case is of secondary interest; it plays a supportive role, facilitating our understanding of something else. The case is often looked at in depth, its contexts scrutinized, its ordinary activities detailed, and because it helps the researcher pursue the external interest. The case may or may not be seen as typical of other cases (Stake, 1995).
Collective case study	Collective case studies are similar in nature and description to multiple case studies (Yin, 2003)

Table 8. Definitions of different types of case studies (Baxter and Jack, 2008)

Yin (1994) has proposed three data collection principles for case studies: collect data from a variety of sources; establish a database of case studies and ensure that a chain of evidence is maintained.

- **Interviews**

Interviews are a common data collection approach in a variety of fields. In-depth interviews can be used to gain a better understanding of complex social issues (DiCicco-Bloom & Crabtree, 2006). Brinkmann and Kvale (2009: 02) define an interview as "an inter-view, where knowledge is constructed in the inter-action between an interviewer and the interviewee. An interview is literally an interview, an inter-change of views between two persons conversing about a theme of mutual interest". In other word, interviewing is like a relationship where there are three parties: the interviewer, the interviewees, and the topics or ideas they are talking about (Moen and Middelthon, 2015). And the purpose of an interview is to "gather descriptions of the life-world of the interviewee with respect to interpretation of the meaning of the described phenomena" (Kvale, 1983: 174).

Structured interviews, semi-structured interviews and unstructured interviews are three primary types of interviews (DiCicco-Bloom and Crabtree, 2009). Generally, structured interviews consist of a series of predetermined questions that are asked verbally without much variation. They also do not allow for follow-up questions on responses that warrant further explanation. Therefore, they are comparably quick to conduct, and they

may be particularly useful if certain questions need to be clarified, or if respondents are likely to have literacy or numeracy difficulties. As a result, they are of limited use if 'depth' is required (Gill, Stewart, Treasure & Chadwick, 2008). In contrast, Unstructured interviews are unorganised and lacking in pre-formed theories or ideas (May, 1991). Unstructured interviews are usually quite time-consuming which can be hard to manage and cooperate, and participants often find them confusing and unhelpful because they lack predetermined interview questions to guide what to talk about (Gill, Stewart, Treasure & Chadwick, 2008). As a matter of fact, most qualitative interviews are semi-structured (Moen & Middelthon, 2015) because they offer "sufficient flexibility to approach different respondents differently while still covering the same area of data collection" (Noor, 2008 : 1604). Britten (1999) describes that by using some key open-ended questions, semi-structured interviews can not only help to specify the research context, but also let interviewers and interviewees to engage interactively and give ideas in more detail.

The types of interviews can also be classified to informal, conversational interview, general interview guide approach, standardised, open-ended interview and closed, fixed-response interview. In an informal, conversational interview, there are no pre-set questions asked to stay as open and flexible to the character and priorities of the interviewee as possible, where the interviewer goes through the motions during the interview. The general interview guide approach is designed to ensure that each interviewee receives the same general areas of information, and it provides more emphasis than the conversational approach while yet allowing for some compatibility

in gathering information from the interviewee. In a standardised, open-ended interview, interviews are conducted using the same set of open-ended questions for all participants, which speeds up the interview process and makes it easier to compare results. Similarly, the same questions are asked to all interviewees, and they are asked to choose answers from the same set of options in a closed, fixed-response interview, those who are not used to interviewing will benefit from this approach (Valenzuela and Shrivastava, 2002).

The advantages of interviews are obvious. They can target focus on the topic of the case study (Yin, 1994) and get in-depth and flexible of details from interviewees. However, there are some disadvantages of interviews, such as time being consuming, or incomplete recording of the interviews. Issue of validity is also a key matter to consider when undertaking an interview. Interviewees are likely to shade truth and show a positive image to interviewers when they are asked about their thinking. Therefore, questions like "Do respondents tell the truth, the whole truth, and nothing but the truth?" are always to be asked (Weiss, 1995: 147), "shading responses to present a positive picture of the self is especially likely when respondents are asked about opinions, attitudes, appraisals, evaluations, values, or beliefs."

- **Focus Groups**

Focus groups are group interviews which consist of ideally six to eight people having a common experience and last typically one to two hours. Focus groups collect data from

both individuals and individuals as part of a group (Massey, 2011). Interviewees in a focus group may be asked the same types of question as in in-depth individual interviews, but within its social context (Armstrong & Massey, 2002; Boaz, Ziebland, Wyke, & Walker, 1998; Watson & Robertson, 1996).

Focus groups allow researchers to collect data flexibly and quickly because they can be arranged quickly. Focus groups are quite useful because they can help not only understand the reasons behind attitudes and behaviours of the interviewees (Greenbaum, 1999), but also the attitudes of stakeholders towards a specific phenomenon (Barbour &Kitzinger, eds., 2001; Krueger, 2014; Wibeck, Dahlgren, & Oberg, 2007). Participants tend to be more willing to share their opinions and discuss within a group rather than to an individual interviewer. But in turn, participants are more easily influenced by social impact and group members. In addition, focus groups are often criticised as lacking more detail in data analysis (Gilflores & Alonso, 1995; Morgan, 1997; Hurworth, 2003; Myers & Macnaghten, 1999; Webb & Kewem, 2001).

- **Participant Observation**

Observation is a data collection of recording whatever happens in the field, while participant observation especially aims to get information from interactions between people, where researchers act as "insiders" to witness and share the experiences in the field (Moen & Middelthon, 2015). Schensul, Schensul, and LeCompte (1999: 91) defined participant observation as "the process of learning through exposure to or

involvement in the day-to-day or routine activities of participants in the researcher setting."

Participant observation provides opportunities to collect data mainly from verbal actions (Moen & Middelthon, 2015), which can check the validity of what people say they believe and do during interviews and focus groups. Data collected through participant observation is also used by researchers to support the usability of other methods, such as focus groups and interviews (Mack, 2005). Participant observation is initially used to foster relationships among researchers and key informants, who are crucial for the research to become a reality (Mack, 2005). There are several advantages of participant observation, including giving access to the "backstage culture", allowing for more detail information, and providing opportunities to view and participant in unscheduled events (De Munck and Sobo et al., 1998). Participant observation also improves the quality of data collected and the development of fresh research questions (DeWalt and DeWalt, 2011). However, the main weaknesses of participant observation are that it is time-consuming, and it can be difficult to document the data.

There are several things to observe during participant observation, including appearance, verbal behavior and interaction, physical behavior and gestures, personal space, human traffic, people who stand out and anything related to the research questions. The following table organized what to observe during a participant observation (Mack, 2005: 20):

Category	Includes	Researchers should note
Appearance	Clothing, age, gender, physical appearance	Anything that might indicate membership in groups or in sub-populations or interest to the study, such as profession, social status, socioeconomic class, religion, or ethnicity
Verbal behaviour and interactions	Who speaks to whom and for how long; who initiates interaction; languages or dialects spoken; tone of voice	Gender, age, ethnicity, and profession of speakers; dynamics of interaction
Physical behaviour and gestures	What people do, who does what, who interacts with whom, who is not interacting	How people use their bodies and voices to communicate different emotions; what individuals' behaviours indicate about their feelings toward one another, their social rank, or their profession
Personal space	How close people stand to one another	What individuals' preferences concerning personal space suggest about their relationships
Human traffic	People who enter, leave, and spend time at the observation site	Where people enter and exit; how long they stay; who they are(ethnicity, age, gender); whether they are alone or accompanied; number of people

Category	Includes	Researchers should note
People who stand out	Identification of people who receive a lot of attention from others	The characteristics of these individuals; what differentiates them from others; whether people consult them or they approach other people; whether they seem to be strangers or well known by others present

Table 9. Things to observe during a participant observation (Mack, 2005:20)

It is helpful to document the information while observing. The researcher should be open to the unexpected and do not let his expectations influence the observations. Field notes, recording in field notebooks, are typical documentation of participant observation data. The data contained in these records represent everything the researcher have experienced, everything the researcher have learned from interacting with others, and everything the researcher have observed. Field notes should include an account of all the events that occurred, along with commentary on the behaviors and reactions of people, as well as the things people said, the locations where they were situated, their patterns of movement, and any other observations that are essential to telling the story of the participant observation experience (Mack, 2005).

- **Documentation**

Since what people say and what they do can sometimes differ, documentary evidence is used to cross-validate information gathered through interviews and observational

studies. Documents serve as guidelines to assist the researcher with his investigation during the interview (Noor, 2008).

Before selecting which methods to be adopted in the research, it is essential to cognise the advantages and disadvantages of each collection method:

Information Collection Tools	Advantages	Disadvantages
Observation	• Collect data where and when an event or activity is occurring • Does not rely on people's willingness to provide information • Directly see what people do rather than relying on what they say they do	• Susceptible to observer bias • Hawthorne effect - people usually perform better when they know they are being observed • Does not increase understanding of why people behave the way they do
Document Review	• Relatively inexpensive • Good source of background information • Unobtrusive • Provides a "behind the scenes" look at a program that may not be directly observable • May bring up issues not noted by other means	• Information may be inapplicable, disorganised, unavailable or out of date • Could be biased because of selective survival of information • Information may be incomplete or inaccurate • Can be time consuming to collect,

Information Collection Tools	Advantages	Disadvantages
		review, and analyse many documents
Interviews	• Useful for gaining insight and correct into a topic • Allows respondents to describe what is important to them • Useful for gathering quotes and stories	• Susceptible to interview bias • Time consuming and expensive compared to other data collection methods • May seem intrusive to the respondent
Focus groups	• Quick and relatively easy to set up • Group dynamics can provide useful information that individual data collection does not provide • Is useful in gaining insight into a topic that may be more difficult to gather information through other data collection methods	• Susceptible to facilitator bias • Discussion can be dominated or sidetracked by a few individuals • Data analysis is time consuming and needs to be well planned in advance • Does not provide valid information at the individual level • The information is not representative of other groups

Information Collection Tools	Advantages	Disadvantages
Case Studies	• Fully depicts people's experience in program input, process, and results • Powerful way of portraying program to outsiders	• Usually quite time consuming to collect information, organise and analyse it • Represents depth of information rather than breadth

Table 10. Advantages and disadvantages of each data collection method (Finn and Jacobson, 2008) (Jacobson, Pruitt Chapin & Rugeley, 2009) (Russ-Eft and Preskill, 2001)

3.2 Research Design, Structure and Process

The research methodology for this PhD research is qualitative research method with case studies, where documentations, semi-structured interviews, participant observation are the main methods to carry out the case studies. The documentation provides general information on potential cases and information which cannot gain from interviews or participant observations for selected cases. The interviews and participant observation provide information that address the research questions.

As mentioned before, there are three categories of humanitarian architecture, which are the disaster-relief projects, the post-disaster projects, and the socially aware projects, which is non-disaster relief projects. The disaster-relief projects and the post-disaster projects are excluded in this research as there are relatively much more literatures on these two areas, although the literature review of humanitarian architecture in this

research has some overlaps with the researchers who are investigating the other two types. This research will focus on three selected case studies selected from seven potential cases that present the non-disaster relief humanitarian architecture in the disadvantaged communities of China. The seven potential cases are *Yuhu Elementary School project in Yunnan province, Bridge School project in Fujian province, Qinmo Primary School project in Guangdong province, Tongjiang Recycled Brick School project in Jiangxi province, Huangshan Xiuning Shuanglong Primary School project in Anhui province, Maosi Ecological Demonstration Primary School project in Gansu province and Xiashan Primary School in Zhejiang province,* which are all from different locations of China.

Table 11. Location of seven potential cases and selected three cases (by Author)

The following table lists the seven potentials cases and their basic information on project initiation and delivery:

Projects	Location	Year	Project Initiator	Project Sponsor	Project Delivery
Yuhu Elementary School	Yunnan	2004	China Youth Development Foundation	• Local government • Local community • Li Xiaodong • Donors from Singapore and China	• China Youth Development Foundation • Local government • Li Xiaodong Atelier and students from School of Architecture, National University of Singapore
Bridge School	Fujian	2009	China Youth Development Foundation	• Local government • Susanna Yang • Li Xiaodong	• China Youth Development Foundation • Local government • Li Xiaodong Atelier
Qinmo Primary School	Guangdong	2008	Rural Urban Framework	• Zheng Yishi and Yang Baoqi • Kadoorie Farm and Botanic Garden • Lu Qianshou Charitable Foundation • Little Yellow Flower Education Foundation	• Rural Urban Framework • Kadoorie Farm • The University of Hong Kong • Sacred Heart Canossian College
Tongjiang Recycled Brick School	Jiangxi	2012	World Vision Hong Kong	• World Vision Hong Kong • Lu Qianshou Charitable Foundation	• Rural Urban Framework
Huangshan Xiuning Shuanglong Primary School	Anhui	2012	WSP Architects	• Commonweal charity organized by WSP Architects: Relevant government departments, social resources including famous companies and universities	• WSP Architects • Commonweal charity organized by WSP Architects: Relevant government departments, social resources including famous companies and universities

				• Anhui University Education Foundation	
Maosi Ecological Demonstration Primary School	Gansu	2007	Local Government invited the Chinese University of Hong Kong to fund, design and build the school	• The Chinese University of Hong Kong • Wuzhiqiao (Bridge to China) Charitable Foundation • Kadoorie Farm and Botanic Garden	• The Chinese University of Hong Kong • Department of Architecture, Xi'an Jiaotong University
Xiashan Primary School	Zhejiang	2017	STI Studio, Architectural Design & Research Institute of Zhejiang University Department of Architecture, Zhejiang University	• Local government	• STI Studio, Architectural Design & Research Institute of Zhejiang University • Department of Architecture, Zhejiang University

Table 12. Basic information on project initiation and delivery of seven potential cases (by Author)

These seven projects will be briefly summarised in this section.

1. **Yuhu Elementary School Expansion Project**

Figure 2. Yuhu Elementary School Expansion Project (ArchDaily, 2011)

Yuhu Elementary School Expansion Project designed by Li Xiaodong Atelier is a community service project located in Lijiang, Yunnan Province, China. Architect Li Xiaodong is the first architect to build Hope Primary School in China. This project tries to respond the local vernacular architecture through the basic environment comprehension, social and building conservation. The local materials and technologies have been transformed into contemporary architecture language and engaged with the existing local community. The Yuhu Elementary School Expansion Project is initiated by China Youth Development Foundation and delivered by Li Xiaodong Atelier and students from School of Architecture, National University of Singapore, where the architect was teaching at the time.

2. Bridge School

Figure 3. Bridge School. The lightweight inhabited bridge acts as a foil to the neighbouring thick stone historical structure. Photography by Li Xiaodong (Slessor, 2009)

The Bridge School designed by Li Xiaodong Atelier which was constructed in 2009 in the village of Xiashi in Pinghe County, Fujian Province in southeast China. It was initiated and designed by architect Li Xiaodong and project manager Chen Jiansheng in 2008. It was to be fully funded at the beginning by a personal donor, but finally completed in cooperation with an NGO, the China Youth Development Foundation (CYDF) due to financial difficulties. It forms a bridge over creek between two old castles, containing two classrooms, a playground for children and a stage for the villagers, which aims to link the past, current and future. This project has won 2010 Aga Khan Award for Architecture. However, the school is currently not used as a school and thus it is a special case within seven potential cases.

3. Qinmo Primary School

Figure 4. Qinmo Primary School. The roof of classrooms is used as a community garden (World-Architects, n.d.)

Qinmo Primary School by Rural Urban Framework is in Huaiji, Guangdong Province, one of the poorest regions in China. The project was initiated by rural Urban Framework and sponsored by multiple donors including personal donors, Kadoorie Farm and Botanic Garden, Lu Qianshou Charitable Foundation and Little Yellow Flower Education Foundation. It then was delivered mainly by Rural Urban Framework with cooperation of Kadoorie Farm, the University of Hong Kong, and the Sacred Heart Canossian College. The project aims to provide a long-term sustainable development to this rural village and the school is designed to blend into the village landscape of farming terraces, the roof is used as a community garden related to the classrooms

below. The project began with Qinmo Primary School and was followed by a community centre and eco-farm.

4. Tongjiang Recycled Brick School

Figure 5. Tongjiang Recycled Brick School (World-Architects, n.d.)

Tongjiang Recycled Brick School locates in Jiangxi Province, China and commissioned by World Vision Hong Kong and Rural Urban Framework in 2012. Same with Qinmo Primary School project, it was delivered by Rural Urban Framework as well. The project aims to respond the site context and create a unique learning and social interaction space, rather than traditional local two-story buildings with open balconies. Concrete, bricks, recycled bricks are principal materials used in the project.

5. Huangshan Xiuning Shuanglong Primary School

Figure 6. Huangshan Xiuning Shuanglong Primary School (Worldarchitecture.org, n.d.)

Huangshan Xiuning Shuanglong Primary School designed by WSP Architects is located in Huangshan, Anhui Province, China, where is the hometown of chief designer Wu Gang. The architect has advocated in rural public welfare projects for many years. The project was fully initiated, sponsored, and designed by WSP Architects. The school includes new buildings with 7 classrooms and activity spaces and a reconstructed building. The design is based on sustainable concepts and deep research into local environment. “Recyclable building materials were used to reduce energy consumption and mitigate environmental pollution. Exterior walls were built in a sequence of the thermal insulating rock wool sandwich board, light steel structure, surface, and waterproof polycarbonate multilayer board from the inside to outside. Between the thermal insulation layer and surface, an air interlayer extending from the south facade to roof was formed for air draft in summer and thermal insulation in winter by opening/closing the air vents. Polycarbonate multilayer boards were used for natural

lighting of the buildings and all classrooms are provided with homogeneous diffused light to avoid shadow when the light irradiates the classrooms. In addition, effective design means were used to reduce energy consumption of the buildings and create comfortable indoor environment" (Worldarchitecture.org, n.d.).

6. Maosi Ecological Demonstration Primary School

Figure 7. Maosi Ecological Demonstration Primary School. The school is divided into 10 individual classrooms, orientated to maximise solar gain. (Slessor, 2009)

Maosi Ecological Demonstration Primary School is delivered by the Chinese University of Hong Kong and the Department of Architecture from Xi'an Jiaotong University under the aim of creating a template for how to build a cheap sustainable school in remote areas of China. The local government invited the Chinese University of Hong Kong to fund, design and build the school. The school has 10 individual sing-storey

classrooms, following the typography of site to maximise solar gain. The mud bricks, rubbles, straws, reeds, and roof tiles recycled from around the village have been used.

7. Xiashan Primary School

Figure 8. Xiashan Primary School (Yu, 2017)

Xiashan Primary School located in Anji County, Zhejiang Province, China is designed by STI Studio, Architectural Design and Research Institute of Zhejiang University, and Department Of Architecture, Zhejiang University. It is a resettlement primary school project to solve social problem of reconstruction and demolition resettlement. The

project has two phases, and the first phase has been completed in April 2016. According to the architect Qin Luofeng, the basic completion of the final phase has already been finished, but the project still has not go through the final acceptance. The government will renovate some of it and add underground parking under the large playground. Moreover, the project is a public welfare project which is initiated, sponsored, and operated by the local government. The local government hired the architect to do the design. As a kind of discount from the designer and Zhejiang University, the design fee is quite low.

Eventually, three cases, *the Bridge School project, the Huangshan Xiuning Shuanglong Primary Schoo and the Xiashan Primary School* have been selected from the seven potential cases, table 13 & 14 are developed to clarify the reasons for the decisions:

Potential Cases	
Bridge School	√
Huangshan Xiuning Shuanglong Primary School	√
Maosi Ecological Demonstration Primary School	
Qinmo Primary School	
Tongjiang Recycled Brick School	
Xiashan Primary School	√
Yuhu Elementary School	

Table 13. Three cases selected from seven potential cases (by Author)

Selected Cases	Project Initiator	What makes it a good case?
Bridge School	NGO: China Youth Development Foundation	• Based on Hope Project launched by CYDF, which is the most widely and most influential public welfare project in China • Special case. The only case within potential cases that is currently not used as a school
Huangshan Xiuning Shuanglong Primary School	PP: WSP Architects	• Easy access • Based on private architectural practice
Xiashan Primary School	HEI: STI Studio, Architectural Design & Research Institute of Zhejiang University Department of Architecture, Zhejiang University	• Based on higher education institution • Social problem: reconstruction and demolition resettlement project • Easy access: currently has contacted architects

Table 14. What makes it a good case for the selected cases (by Author)

As mentioned in chapter 1, the central aim of this PhD research is to understand and help improve the non-disaster relief humanitarian architecture process in the provision of schools in the disadvantaged communities of China and to critically analyse the current non-disaster relief humanitarian architecture process in the provision of schools from the process inception to realization, until post construction and then discuss the potential to propose an improved model for the practice of humanitarian architecture in China. To achieve these, this research will be applied by a multiple-case procedure. Then three to four cases are the best symbolling size for this research. After considerations of different initiating process and delivery mechanisms, the difficulties of accessibility, including the languages and locations, the Bridge School project, the

Huangshan Xiuning Shuanglong Primary School project, and the Xiashan Primary School project are finally selected.

Firstly, all the seven cases are in the home country of the researcher, but not the hometown, therefore, the language issue here is equal to the researcher. Then the timeline for the completion of these seven projects is from 2004 to 2017. Considering five years is a period, the time groups can be divided into three among these seven cases. The first group is from 2004 to 2009, where the Yuhu Elementary School was completed by 2004, the Maosi Ecological Demonstration Primary School was completed by 2007, the Qinmo Primary School was completed by 2008 and the Bridge School was completed by 2009. The second time group is projects completed in 2012, they are the Tongjiang Recycled Brick School and the Huangshan Xiuning Shuanglong Primary School. The final group is only one project, which is the only recent project, the Xiashan Primary School completed by 2017. Considering one project is chosen from each of the three periods, it is evident that Xiashan Primary School will be one of the projects chosen. In addition, as discussed in the beginning of this chapter in terms of subject selection for a case study, a case may be selected when it is representative and typical, where the Bridge School will be typically selected as a special case because it is only case within potential cases that is currently not used as a school.

Reviewing back to the Xiashan Primary School and the Bridge School, one of each from different time group in terms of project completion. The third case then is going to be

selected from the first time group, it could be the Yuhu Elementary School completed by 2004, the Maosi Ecological Demonstration Primary School completed by 2007, the Qinmo Primary School completed by 2008 or the Bridge School completed by 2009. Meanwhile, initiating processes and delivery mechanisms of these projects will be considered. The initial idea is to select each case from three different initiating process, however, there is none simple initiating process, even the project is initiated by a NGO or government, there is cooperation from the other associations, for example, the private architectural practice. Previously, the two chosen cases, the Bridge School and the Xiashan Primary School are under different delivery mechanisms. The Bridge School is initiated by a private architectural practice and finished by cooperation with a NGO, whereas the Xiashan Primary School is initiated by government but design and finished by a private architectural practice. Before conducting the actual case study, both these two projects are consumed to have participation of the university, although this has been overturned in the later research. When reviewing the delivery mechanisms of these potential cases, the Huangshan Xiuning Primary School is stand out as it is initiated, sponsored, and designed all by a private architectural practice, while the others all have a complex cooperation relationship. In conclusion, the Bridge School, the Xiashan Primary School and the Xiuning Shuanglong Primary School have been chosen to be three cases for this research.

The following table lists the research questions of this PhD research and proposed research methods to address each question:

Key Research Questions	Details of the Key Research Questions	Proposed Methods
1. What is humanitarian architecture and why is it growing in importance as a means of providing for disadvantaged communities in China?	• What is humanitarian architecture? • How it helps with the disadvantaged communities in China? • In which means is the importance of humanitarian architecture is growing in providing for disadvantaged communities in China? E.g., Why the long-term operation of humanitarian school constructions in China is needed and how to guarantee that?	• Literature Review Interviews: Semi-structured Interviews
2. How does humanitarian architecture meet community needs in relation to the provision of schools?	E.g., How humanitarian architecture meets the local needs (including academic, economic, environmental, political, and culture needs)? How the local needs affect the humanitarian school design in disadvantaged communities in China?	• Literature Review • Interviews: Semi-structured Interviews • Focus Groups: Six to eight people/one to two hours Observation: Participant Observation

	What are the most basic needs of the disadvantaged communities in China, and how can these basic needs related to education can be satisfied using architectural solutions? How could designers balance between public voice and personal economic needs when engaged in humanitarian architecture in the provision of schools in China? Why humanitarian architecture in the provision of schools in China needs to be designed in accordance with local circumstances?	
3. What are the barriers and drivers to humanitarian architecture in China and how do these affect the process?	E.g., Why humanitarian architecture in the provision of schools should be standard (construction, stability, standard, prefabrication) and how could the prefabricated humanitarian architecture meet the local circumstances in relation to the provision of schools in China?	• Literature Review • Interviews: Semi-structured Interviews • Focus Groups: Six to eight people/one to two hours Observation: Participant Observation

	How could local residents participate in the design process of humanitarian architecture in the provision of schools in China?	
4. How can the process of humanitarian architecture be improved to ensure contextually relevant and successful outcomes in China?	• What is the specific context of humanitarian architecture in China? • How successful of current process of humanitarian architecture in China and what are the unsuccessful aspects? What can be done to improve the process of humanitarian architecture?	• Literature Review • Observation: Participant Observation • Focus Groups: Six to eight people/one to two hours For focus groups, due to special social context in China, if it is not able to get the individuals together, then interviews will be the next preferred option of method.

Table 15. The research questions and proposed research methods to address each question (by Author)

In conclusion, literature review, semi-structured interviews, focus groups and participant observation are proposed data collection methods to address the research questions. Corresponding to each key research question, it can be divided into detailed questions.

The first key research question "What is humanitarian architecture and why is it growing in importance as a means of providing for disadvantaged communities in China?" can be analysed from the following detailed questions, such as "What is humanitarian architecture? How it helps with the disadvantaged communities in China? In which means is the importance of humanitarian architecture is growing in providing for disadvantaged communities in China? Why the long-term operation of humanitarian school constructions in China is needed and how to guarantee that?"

The second key research question "How does humanitarian architecture meet community needs in relation to the provision of schools?" can be broken up into questions like "How humanitarian architecture meets the local needs (including academic, economic, environmental, political, and culture needs)? How the local needs affect the humanitarian school design in disadvantaged communities in China? What are the most basic needs of the disadvantaged communities in China, and how can these basic needs related to education can be satisfied using architectural solutions? How could designers balance between public voice and personal economic needs when engaged in humanitarian architecture in the provision of schools in China? Why humanitarian architecture in the provision of schools in China needs to be designed in accordance with local circumstances?"

Similarly, the third key research question "What are the barriers and drivers to humanitarian architecture in China and how do these affect the process?" can be detailed

to “Why humanitarian architecture in the provision of schools should be standard (construction, stability, standard, prefabrication) and how could the prefabricated humanitarian architecture meet the local circumstances in relation to the provision of schools in China? How could local residents participate in the design process of humanitarian architecture in the provision of schools in China?”

The final key research questions will do the same way with expanding the question from “How can the process of humanitarian architecture be improved to ensure contextually relevant and successful outcomes in China?” to “What is the specific context of humanitarian architecture in China? How successful of current process of humanitarian architecture in China and what are the unsuccessful aspects? What can be done to improve the process of humanitarian architecture?” These help to refine these key questions, to analyse the key questions more systematically and find the answers properly. Some questions may involve only a few of these research methods, while others will involve all research methods.

The following tables list the detail of how to adopt the selected research methods in the data collection.

Selected Research Methods	How to apply selected research methods
Literature Review	All the documentation related to the research questions
Interviews: Semi-structured Interviews	• Types of interviewees: Children, teachers, school operators, parents, local administration, local architects, NGOs • What sort of information to get from these interviewees? E.g., What sort of changes they have by humanitarian architecture, economic, social, cultural, lifestyle and others? Are they satisfied with the current condition, if not, what kind of things they want to get improved? What are the most basic needs of them in relation to the provision of schools? Do they think the current humanitarian architecture in China has met community needs in the provision of schools, if not, why? What aspects of humanitarian architecture in China in the provision of schools should be improved? For the local architects, do they want to involve in humanitarian architecture and why? How do they think about humanitarian architecture in China in related to schools? What do they think about the barriers and drivers of humanitarian architecture in China? What are their opinions towards the standard of humanitarian architecture in China?
Focus Groups	• Types of participants: Topic related people from local community.

	• Purpose of focus groups: When used in the early stage of this research project, focus groups can help to refine the research questions from the interaction among different participants. Focus groups can help to fill in gaps that individual interviews cannot reach, because participants are always more willing and able to use their preferred style of languages within a group. • Specific design questions and statements for the focus groups: E.g., What do you think are the needs of disadvantaged communities in relation to the provision of schools? Do you think humanitarian architecture should meet the local community needs and why? Are you satisfied with the humanitarian architecture in the provision of schools within your local community and why? What aspects of your local humanitarian architecture in the provision of schools should get improved? If you are an architect, do you want to involve in humanitarian architecture and why? What do you think are the barriers and drivers of humanitarian architecture in China and will these affect the process and how? For example? What's your opinion about standard of humanitarian architecture and should humanitarian architecture in the provision of schools in China should be standard? Do you agree that local residents should get involved in the process of humanitarian architecture? How can the process of humanitarian architecture be improved to ensure contextually relevant and successful outcomes in China?
Observation: Participant Observation	• Things to observe:

	Observe during both the establishing process of the project and operation of the school. People's physical behaviors and gestures, include what people do in the school, who does that, the interaction between teachers and students, students and students, and their emotions. People who stand out, their characteristics, what they do, what differentiates them from others and their emotions.

Table 16. The details of how to adopt the selected research methods in the data collection (by Author)

Revisit the 4 key research questions here:

RQ1. What is humanitarian architecture and why is it growing in importance as a means of providing for disadvantaged communities in China?

RQ2. How does humanitarian architecture meet community needs in relation to the provision of schools?

RQ3. What are the barriers and drivers to humanitarian architecture in China and how do these affect the process?

RQ4. How can the process of humanitarian architecture be improved to ensure contextually relevant and successful outcomes in China?

After organizing the detailed questions to help narrow down the 4 key research questions, there are 11 sub-research questions:

SRQ1. What are the responsibilities of architects involved in the humanitarian architecture in the provision of schools in China, how do these happen and how do these affect the process of the projects?

SRQ2. How do universities/private architectural practices/NGOs participate in humanitarian architecture in relation to schools in China?

SRQ3. How do different delivery mechanisms affect the success of humanitarian architecture in relation to the provision of schools in China and how can these be improved?

SRQ4. Why is the long-term operation of humanitarian school constructions in China needed and how to guarantee that?

SRQ5. What are the most basic needs of the disadvantaged communities in China, and how can these basic needs related to education can be satisfied using architectural solutions?

SRQ6. How could architects balance between the local basic needs and architectural design innovation?

SRQ7. How could designers balance between public voice and personal economic needs when engaged in humanitarian architecture in the provision of schools in China?

SRQ8. Why should humanitarian architecture in the provision of schools should be standard (construction, stability, standard, prefabrication) and how could prefabricated humanitarian architecture meet the local circumstances in relation to the provision of schools in China?

SRQ9. How successful is the current process of humanitarian architecture in China and what are the unsuccessful aspects and how to improve?

SRQ10. Why should sustainable design solutions be provided to the disadvantaged communities of China?

SRQ11. Is there any university-affiliated design/build studio or community design centre in China? If not, how could this be introduced to China?

This table sorts out the research methods corresponding to each sub-research question：

	SRQ 1	SRQ 2	SRQ 3	SRQ 4	SRQ 5	SRQ 6	SRQ 7	SRQ 8	SRQ 9	SRQ 10	SR Q11
Literature Review	√	√	√	√	√	√	√	√	√	√	√
Interviews: Semi-	√	√	√	√	√	√	√	√	√	√	√
Focus Groups					√			√		√	
Observation: Participant Observation					√	√	√		√		

Table 17. The research methods corresponding to each sub-research question (by Author)

The Nature, Purpose, and Duration of the Case Study:

Case Study is the main research method for this study, following with interviews, observation, and documentation. The research will be conducting semi-structured interviews with 10-15 participants for the case study. The participants are selected by their relationships with selected case studies, including architects, officials, teachers, people from local communities). The duration of the interview will be between 45 to 60 minutes.

To participate in this research is voluntary; there is no payment or expenses associated with participating in the research. Emails/ Official letters will be sent to potential interviewees to invite them to participate in the research. Before the interview, interviewees will be sent the interview questions and consent form. The interviews will be conducted once the potential interviewees have approved and signed the consent form. In addition, interviewees hold the freedom to withdraw from the study at any time without giving a reason. The interviews will be conducted through Face to Face, Phone or WeChat, based on the interviewee preference. All documents will be provided to potential interviewees in both English and Chinese (Mandarin) and the interviews will be conducted in Chinese (Mandarin), the researcher's native language.

To ensure confidentiality of personal information and anonymity of data both during the study and in the release of its findings, information will not be accessed or used by

anyone else apart from the researcher and supervisor. The interviewees will be given the options in the consent form if they want their personal information to be identified or not. Paper records should be stored in a locked filing cabinet. Digital data should be stored only on a password-protected computer and/or on a secure server. In accordance with the Data Protection Act, the data needs to be kept securely for seven years following publication kept securely for seven years following publication of results. After this time, electronic files will be deleted, and any hard copies will be destroyed. At the end of a student project, students are responsible for ensuring that all data from the study is passed on to their academic supervisor/s. The supervisors/s will then have responsibility for the storage of that data.

During the research, all photos, videos and audios taken by the researcher will be stored in a password protected filed and stored in a locked filing cabinet and scanned to be stored digitally on a password protected external hard drive. The researcher and supervisor will be the only person with access to the raw data. All data handling and storage will be in line with the University of Nottingham Research Code and Research Ethics of Conduct. The data will be archived in the university record storage facilities for seven years after the research completion and the degree has been awarded. The participant is free to decline to take part or withdraw from the study at any time. If they decide after the interview to withdraw, their data will not be included in the study.

The Population to be Studied in the Research:

The interview aims to collect data from different typologies of people involved in the selected humanitarian school projects, including Architects; Architects involved in humanitarian school projects; Project manager of selected humanitarian school projects; NGO Staffs; Officials of local government and education bureau; Teachers working in selected humanitarian schools and Parents of students in selected humanitarian schools.

Interview questions are related to process of humanitarian architecture; interviewees' involvement; interviewees' experiences good/bad; interviewees' ideas on potential for improvement/change.

The table lists the interview questions for the case study:

Interviewees	Questions	Sub-questions
Architects involved in potential case studies	• Process of humanitarian architecture. • Their involvement. • Their experiences good/bad. • Potential for improvement/change.	• What motivated you to do this project, as it is a humanitarian architectural project in relation to schools in disadvantages communities in China? • At what stage did your involvement in this project begin? • During the process of the design, what information did you have about the potential users of the school? • Can you share with me your experiences during the project, and

		was there anything you feel was particularly good or bad? • During the delivery of the project, how did you persuade local community to accept your ideas? *For example, it is a creative design rather than a traditional school construction, etc*. • Do you feel the time you spent and efforts that you gave are worthy after the project's completion? • Have you monitored the maintenance of the school after the project's completion? • Do you want to be involved in humanitarian architecture projects again? • Who provided the design fees? Was it enough for the project? How does it compare with your normal business cases? • What do you think about the whole process of this project? • Do you have any suggestions for potential improvement? • What do you think could encourage more humanitarian architecture projects in China? • What do you think are the current barriers to humanitarian architecture projects in China? • Are you aware of any other architects undertaking humanitarian projects?

		• Are you aware of any other humanitarian projects? Any Schools? • What do you think about the cooperation system of humanitarian architecture projects in China? • What do you think about the overall situation of humanitarian architecture in China?
Government Officials involved in potential case studies	• Process of humanitarian architecture. • Their involvement. • Their experiences good/bad. • Potential for improvement/change.	• What is the role and responsibility of the government in this project? • Can you share with me your experience in the project, and is there anything you feel was particularly good or bad? • What do you think about the whole process of this project? • Do you have any suggestions for potential improvement? • What do you think are the advantages and disadvantages of the government being involved in the project? • Has the government provided financial support for the project? • Are there any relevant government policy and framework to encourage humanitarian architecture projects? • What do you think about the cooperation system of humanitarian architecture projects in China? • What do you think about the overall situation of humanitarian architecture in China?

		• What do you think could encourage more humanitarian architecture projects in China? • What do you think are the current barriers to humanitarian architecture projects in China?
NGO Staff involved in potential case studies	• Process of humanitarian architecture. • Their involvement. • Their experiences good/bad. • Potential for improvement/change.	• What is the role and responsibility of your organization in this project? • Can you share with me your experience in the project, and is there anything you feel was particularly good or bad? • How does your organization operate this kind of humanitarian architecture projects? Is this project same with other projects? (Do you have a universal standard for humanitarian architecture projects that you are involved in?) • Where does the funding come from for this project? And what is the normal way that your organization manages the funding? • What do you think about the whole process of this project? Do you have any suggestions for potential improvement? • What do you think about the cooperation system of humanitarian architecture projects in China? • What do you think about the overall situation of humanitarian architecture in China? • What do you think about providing architectural solutions as public

		welfare supports for the disadvantaged communities? • What do you think could encourage more humanitarian architecture projects in China? • What do you think are the current barriers to humanitarian architecture projects in China?
Teachers working in potential case studies	• Their experiences good/bad. • Potential for improvement/change.	• What are your overall views about the school building project? • Where you aware that the school was achieved as part of a humanitarian architecture project? • Have you experienced any change in your teaching which comes from the designed school building? It could be something you feel good about or not. • What do you think are the most basic needs of children in your school? • Do you think the building designed has met the needs of your local community and children in the school and sufficiently solved the problems? • Do you have any ideas for how the project could have been better? • Do you have any other comments on the project?
Parents of students in potential case studies	• Their children's experiences good/bad; • Potential for improvement/change.	• What are your overall views about the school building project? • Where you aware that the school was achieved as part of a humanitarian architecture project?

		• What are the changes the project gave to you and your families? Are they good or bad? • Do you think your child/children enjoy the new school? • Do you have any ideas for how the project could have been better? • Do you have any other comments on the project?
Other Architects	• Process of humanitarian architecture. • Their involvement. • Their experiences good/bad. • Potential for improvement/change.	• Have you ever been involved in any humanitarian architecture projects? • If yes, what motivated you to do that project(s)? • If yes, can you share me your experience in that project, and is there anything you feel was particularly good or bad? • If yes, do you feel the time you spent and efforts that you gave are worthy after the project completion? • If yes, have you monitored the maintenance of the school after the project completion? • If not, do you know what humanitarian architecture is? • If not, do you want to be involved in humanitarian architecture projects in your further career plan? • What do you think about the overall situation of humanitarian architecture in China? • Can you give some suggestions about how to improve the process of humanitarian architecture in China and what do you think could

		encourage more humanitarian architecture projects in China? • What do you think are the current barriers to humanitarian architecture projects in China?

Table 18. The interview questions for the case study (by Author)

These interview questions can be classified by categories corresponding to the research questions:

Key Research Questions	Sub Research Questions	Interview Questions
1. What is humanitarian architecture and why is it growing in importance as a means of providing for disadvantaged communities in China?	SRQ1. What are the responsibilities of architects involved in the humanitarian architecture in the provision of schools in China, how do these happen and how do these affect the process of the projects? SQR10. Why should sustainable design solutions be provided to the disadvantaged communities of China?	***Architects involved in potential case studies:*** What motivated you to do this project, as it is a humanitarian architectural project in relation to schools in disadvantages communities in China? Do you feel the time you spent and efforts that you gave are worthy after the project's completion? Do you want to be involved in humanitarian architecture projects again? Are you aware of any other architects undertaking humanitarian projects? Are you aware of any other humanitarian projects? Any Schools? What do you think about the overall situation of humanitarian architecture in China? ***Government Officials involved in potential case studies:***

		What do you think about the overall situation of humanitarian architecture in China? ***NGO Staff involved in potential case studies:*** What do you think about the overall situation of humanitarian architecture in China? What do you think about providing architectural solutions as public welfare supports for the disadvantaged communities? ***Other Architects:*** Have you ever been involved in any humanitarian architecture projects? If not, do you know what humanitarian architecture is? If not, do you want to be involved in humanitarian architecture projects in your further career plan? What do you think about the overall situation of humanitarian architecture in China?
2. How does humanitarian architecture meet community needs in relation to the provision of schools?	SRQ5. What are the most basic needs of the disadvantaged communities in China, and how can these basic needs related to education can be satisfied using architectural solutions? SRQ6. How could architects balance between the local basic needs and architectural design innovation?	***Architects involved in potential case studies:*** During the process of the design, what information did you have about the potential users of the school? During the delivery of the project, how did you persuade local community to accept your ideas? *For example, it is a creative design rather than a*

	SRQ8. Why should humanitarian architecture in the provision of schools should be standard (construction, stability, standard, prefabrication) and how could prefabricated humanitarian architecture meet the local circumstances in relation to the provision of schools in China?	*traditional school construction, etc*. ***Teachers working in potential case studies:*** What are your overall views about the school building project? Where you are aware that the school was achieved as part of a humanitarian architecture project? Have you experienced any change in your teaching which comes from the designed school building? It could be something you feel good about or not. What do you think are the most basic needs of children in your school? Do you think the building designed has met the needs of your local community and children in the school and sufficiently solved the problems? Do you have any ideas for how the project could have been better? Do you have any other comments on the project? ***Parents of students in potential case studies:*** What are your overall views about the school building project? Where you are aware that the school was achieved as part of a humanitarian architecture project?

		What are the changes the project gave to you and your families? Are they good or bad? Do you think your child/children enjoy the new school? Do you have any ideas for how the project could have been better? Do you have any other comments on the project?
3. What are the barriers and drivers to humanitarian architecture in China and how do these affect the process?	SRQ4. Why is the long-term operation of humanitarian school constructions in China needed and how to guarantee that? SRQ7. How could designers balance between public voice and personal economic needs when engaged in humanitarian architecture in the provision of schools in China?	***Architects involved in potential case studies:*** Who provided the design fees? Was it enough for the project? How does it compare with your normal business cases? What do you think could encourage more humanitarian architecture projects in China? What do you think are the current barriers to humanitarian architecture projects in China? ***Government Officials involved in potential case studies:*** Has the government provided financial support for the project? Are there any relevant government policy and framework to encourage humanitarian architecture projects? What do you think could encourage more humanitarian architecture projects in China? What do you think are the current barriers to

		humanitarian architecture projects in China? ***NGO Staff involved in potential case studies:*** Where does the funding come from for this project? And what is the normal way that your organization manages the funding? What do you think could encourage more humanitarian architecture projects in China? What do you think are the current barriers to humanitarian architecture projects in China? ***Other Architects:*** What do you think are the current barriers to humanitarian architecture projects in China?
4. How can the process of humanitarian architecture be improved to ensure contextually relevant and successful outcomes in China?	SQR2. How do universities/private architectural practices/NGOs participate in humanitarian architecture in relation to schools in China? SRQ3. How do different delivery mechanisms affect the success of humanitarian architecture in relation to the provision of schools in China and how can these be improved? SRQ9. How successful is the current process of humanitarian architecture in China and what are the unsuccessful aspects and how to improve? SRQ11. Is there any university-affiliated	***Architects involved in potential case studies:*** At what stage did your involvement in this project begin? Can you share with me your experiences during the project, and was there anything you feel was particularly good or bad? Have you monitored the maintenance of the school after the project's completion? What do you think about the whole process of this project? Do you have any suggestions for potential improvement? What do you think about the cooperation system of

	design/build studio or community design centre in China? If not, how could this be introduced to China?	humanitarian architecture projects in China? ***Government Officials involved in potential case studies:*** What is the role and responsibility of the government in this project? Can you share with me your experience in the project, and is there anything you feel was particularly good or bad? What do you think about the whole process of this project? Do you have any suggestions for potential improvement? What do you think are the advantages and disadvantages of the government being involved in the project? What do you think about the cooperation system of humanitarian architecture projects in China? ***NGO Staff involved in potential case studies:*** What is the role and responsibility of your organization in this project? Can you share with me your experience in the project, and is there anything you feel was particularly good or bad? How does your organization operate this kind of humanitarian architecture projects? Is this project same with other projects? (Do you have a universal standard for humanitarian architecture

		projects that you are involved in?) What do you think about the whole process of this project? Do you have any suggestions for potential improvement? What do you think about the cooperation system of humanitarian architecture projects in China? ***Other Architects:*** Have you ever been involved in any humanitarian architecture projects? If yes, what motivated you to do that project(s)? If yes, can you share me your experience in that project, and is there anything you feel was particularly good or bad? If yes, do you feel the time you spent and efforts that you gave are worthy after the project completion? If yes, have you monitored the maintenance of the school after the project completion? Can you give some suggestions about how to improve the process of humanitarian architecture in China and what do you think could encourage more humanitarian architecture projects in China?

Table 19. Interview questions classified by categories corresponding to the research questions (by Author)

The table lists who to contact for selected case studies:

Selected Cases	Who to Contact	Location
Bridge School	Architect: Li Xiaodong Project manager: Chen Jiansheng NGO staffs from China Youth Development Foundation Local government officials Current manager/ Village representative	Beijing Fujian Zhangzhou
Huangshan Xiuning Shuanglong Primary School	Architect: WSP Architects (Wu Gang) Local government officials Head of school Head teacher Teachers Parents	Beijing Hongkong/Nanjing Anhui Huangshan
Xiashan Primary School	Architect: Qin Luofeng Local government officials Project manager Head of school Head teacher	Zhejiang Hangzhou Zhejiang Huzhou

Table 20. Proposed contacts for selected case studies (by Author)

The designed interview questions focus on the process of humanitarian architecture in china, how the interviewees are involved in the project, their feeling in their experiences and their ideas on potential for improvement or changes of future humanitarian architectural projects in China. The proposed interviewees include architects; architects involved in humanitarian school projects; project manager of selected humanitarian

school projects; NGO staffs; officials of local government and education bureau; teachers working in selected humanitarian schools and parents of students in selected humanitarian schools. However, the actual arrangement of the interviewees depends on the contacts obtained during the actual project investigation.

Proposed Travel plan for the case studies:

Since the cases in this research are primary schools, the actual case study needs to interview relevant school staffs and conduct observations in the school, it is necessary to combine the time schedule of the interviewees and the school holiday schedule when arranging the research time. In addition, since the researcher of this study usually study in the UK, the researcher needs to find a suitable time to go back to China to conduct research. After understanding the school holiday arrangements and communicating with the interviewees, the proposed case study time was selected after the researcher's second year annual review. The proposed case study time is from mid-August 2018 to mid-October 2018. During this time, there will be two national holidays in China, the travel plan needs to play attention to this.

Key dates:

- School open on 3rd September
- Mid-Autumn Festival holiday from 22nd September – 24th September
- 29th September and 30th September as working days
- National Day holiday from 1st October – 7th October

Time	*Location*	*Events*
3rd September – 9th September	Zhangzhou, Fujian Province, China	• Bridge School site visit • Interviews with current building manager or village representative and local government • Interview with project manager Chen Jiansheng
10th September – 16th September	Beijing, China	• Interview with architect Li Xiaodong
17th September – 21st September	Huangshan, Anhui Province, China	• Xiuning Shuanglong Primary School site visit • Interviews with head of school, head teacher, parents and local government
22nd September – 24th September	Mid-Autumn Festival holiday	
25th September – 30 September	Hangzhou & Huzhou, Zhejiang Province, China	• Xianshan Primary School site visit • Interview with architect Qin Luofeng
1st October – 7th October	National Day holiday	
8th October – 14th October	Beijing/ Nanjing/ Hongkong (not confirmed)	• Interview with WSP Architects

Table 21. Proposed travel plan for the case studies (by Author)

Chapter 4: Field Research

Introduction

As mentioned in previous chapter, the research methodology adopted in this PhD research is qualitative research and the main method used is a case study. This section will clearly describe how the on-site case study has been carried out for the three selected projects, the Bridge School project, the Xiashan Primary School project, and the Xiuning Shuanglong Primary School project. The details of field data collection through interviews, focus groups, observation, challenges during the field work and then, how the data to be processed and analysed will be discussed.

4.1 Field Data Collection

Due to the schedule of actual contacts have got, the timelines for investigating the three projects and collecting the data are overlapping. Emails and official letters with the research project overview have been sent to potential people to invite them to participate in the research. In the project overview, the research objectives and aims, what kind of research methods are going to be used are clearly described in both English and Mandarin. The table below estimates the people that have got contact during the actual field data collection.

Actual Contacts During Field Research:

For the case of the Bridge School Project, the number of people who can be interviewed was less than expected. It was expected to have interviews with the chief Architect for the Bridge School project, Li Xiaodong, however, after sending emails to the architect, the architect refused the interview request through his student. In the case of the China Youth Development Foundation, they are unable to share information on individual projects, including information on contributors and funding, due to policy restrictions in place. Interview requests for general information, on the other hand, were ignored by the organization's administration. And it was difficult to contact the government officials in power at the time of the construction of the project because the change of government staffs. Thus, the interviews were only made with the project manager of the Bridge School project, Chen Jiansheng through WeChat interviews and the local villagers when doing the site visit.

In contrast, for the Huangshan Xiuning Primary School Project, the only people not interviewed as planned was the parents of the students in the Huangshan Xiuning Primary School, due to the time limitation on the field. Then all other relevant people planned to interview have successfully conducted the interview. Despite these, there was an extra contact with the architect Zhu Jingxiang, the professor in the Architecture School of the Hong Kong Chinese School, who guided opinions for the Xiuning Shuanglong Primary School project. Similarly, interviews with relevant interviewees of

the Xiashan Priamry School project went smoothly as well. There were successful contacts with the chief Architect, Qin Luofeng, the project manager who was also in Qin's architecture practice, the head of the Xiashan Primary School, and parents of students studied in the Xiashan Primary School. In this project, the only people who did not get in touch and conducted interviews as planned was local government staffs, but the architect provided a scanned version of the official documents on the project communication between the design team and the government, which in a sense made up for the lack of information.

This table lists the actual contacts have got during field research:

Selected Cases	Actual Contacts	Location
Bridge School	Project manager: Chen Jiansheng Local villagers	WeChat Fujian Zhangzhou
Huangshan Xiuning Shuanglong Primary School	Architect: WSP Architects (Wu Gang) Architect Zhu Jingxiang Local government officials Head of school Head teacher Teachers	Beijing HongKong Anhui Huangshan
Xiashan Primary School	Architect: Qin Luofeng Project manager Head of school Parents	Zhejiang Hangzhou Zhejiang Huzhou

Table 22. Actual contacts have got during case studies (by Author)

Actual travel timeline for the case studies:

The proposed case study time was planned from mid-August 2018 to mid-October 2018; however, the actual case study time was from 21st August 2018 to 29th September 2018.This was affected mainly by the schedule of the architects to be interviewed, then the other time were scheduled based on these changes. Nevertheless, it was lucky that the case studies were conducted before the Chinese National Holiday, from 1st October to 7th October, as soon after the holiday it would be difficult to get tickets for the train or planes. Moreover, after the holiday the school stuffs are always busy in preparing for the new academic term.

Time	*Location*	*Events*
21st August	Beijing, China	• Interview with Architect Wu Gang
22nd August – 31st August	Zhangzhou, Fujian Province, China	• Bridge School site visit • Interviews with local villagers
	Beijing, China	• WeChat interviews with project manager Chen Jiansheng
13th September – 14th September	Hong Kong	• Interviews with Architect Zhu Jingxiang
22nd September – 24th September	Mid-Autumn Festival holiday	
25th September – 27th September	Hangzhou & Huzhou, Zhejiang Province, China	• Interview with architect Qin Luofeng • Xianshan Primary School site visit

		• Interviews with parents
27th September –29th September	Huangshan, Anhui Province, China	• Xiuning Shuanglong Primary School site visit • Interviews with head of school, head teacher, and local government officials
29th September	Beijing, China	• WeChat interview with Architect Zhou When

Table 23. Actual travel timeline for the case studies (by Author)

4.1.1 Interviews

Before the interview, interviewees were sent the research information sheet, the interview questions, and the consent form for taking part in the research. The interviews were conducted when the potential interviewees approved and signed the consent form. This part will then introduce how the interviews were conducted for each case. The interviews were carried in the research's home language, Mandarin.

Before arranging the reviews, the Ethics Application for approval of research study involving human participants to Ethics Committee of the University of Nottingham was submitted and been approved.

- **Interviews for Huangshan Xiuning Shuanglong Primary School project:**

Interviewees: WSP Architects Chef Designer: Wu Gang; Xiuning County Government Officials & Xiuning County Education Bureau Officials; Teachers working in Huangshan Xiuning Shuanglong Primary School.

Interview Questions:

With WSP Architects Chef Designer: Wu Gang

Interview Time: 21st August 2018

Interview Place: Beijing WSP Architects office

During the interview with the architect, the interview questions were related to the process of humanitarian architecture; his involvement; his experiences good/bad; his ideas on potential for improvement/change for the Xiuning Shuanglong Primary School project and humanitarian architecture in China. The interview was conducted in the architect's office in WSP Architects in Beijing and during the interview there was assistant of the architect to help introduce the project and made records. The whole interview lasted for nearly one hour. Recording has been made after approval by the architect.

1. What motivated you to do this project (Huangshan Xiuning Shuanglong Primary School), as it is a humanitarian architectural project in relation to schools in disadvantages communities in China?

2. At what stage did your involvement in this project begin?

3. During the process of the design, what information did you have about the potential users of the school?

4. Can you share with me your experiences during the project, and was there anything you feel was particularly good or bad?

5. What inspired you to use the light steel structure, rather than the traditional construction?

6. During the delivery of the project, how did you persuade local community to accept your ideas? For example, it is a creative design rather than a traditional school construction, the new construction materials, etc.

7. Do you feel the time you spent and efforts that you gave are worthy after the project's completion?

8. Have you monitored the maintenance of the school after the project's completion?

9. Do you want to be involved in humanitarian architecture projects again?

10. Who provided the design fees? Was it enough for the project? How does it compare with your normal business cases?

11. What do you think about the whole process of this project?

12. Do you have any suggestions for potential improvement?

13. Could you please share more your ideas about the sustainable charitable model of "education, building, community"?

14. What do you think could encourage more humanitarian architecture projects in China?

15. What do you think are the current barriers to humanitarian architecture projects in China?

16. Are you aware of any other architects undertaking humanitarian projects?

17. Are you aware of any other humanitarian projects? Any Schools?

18. What do you think about the cooperation system of humanitarian architecture projects in China?

19. What do you think about the overall situation of humanitarian architecture in China?

With Xiuning County Government Officials & Xiuning County Education Bureau Officials

Interview Time: 28th September 2018

Interview Place: Anhui Xiuning

The interviews with the Xiuning County government officials & Xiuning County Education Bureau officials were conducted in an informal way. Interview questions were related to process of the Xiuning Shuanglong Primary School project; their involvement in the project; their experiences when using the school and their ideas on potential for improvement or change to the project. The interviews were made with

different officials, and they require not showing name in the research. The whole series interviews lasted for five hours.

1. What is the role and responsibility of the government in this project (Huangshan Xiuning Shuanglong Primary School)?

2. Can you share with me your experience in the project, and is there anything you feel was particularly good or bad?

3. What do you think about the whole process of this project?

4. Do you have any suggestions for potential improvement?

5. What do you think are the advantages and disadvantages of the government being involved in the project?

6. Has the government provided financial support for the project?

7. Are there any relevant government policy and framework to encourage humanitarian architecture projects?

8. What do you think about the cooperation system of humanitarian architecture projects in China?

9. What do you think about the overall situation of humanitarian architecture in China?

10. What do you think could encourage more humanitarian architecture projects in China?

11. What do you think are the current barriers to humanitarian architecture projects in China?

With Teachers working in Huangshan Xiuning Shuanglong Primary School

Interview Time: 28th September 2018

Interview Place: Anhui Xiuning

The interview with teachers working in the Huangshan Xiuning Primary School was in an informal way as well. Interview questions were related to their experiences when using the school and their ideas on potential for improvement or change to the project. The interview was made within an hour and with requirement for not showing name in the research.

1. What are your overall views about the school building project (Huangshan Xiuning Shuanglong Primary School)?

2. Where you are aware that the school was achieved as part of a humanitarian architecture project?

3. Have you experienced any change in your teaching which comes from the designed school building? It could be something you feel good about or not.

4. What do you think are the most basic needs of children in your school?

5. Do you think the building designed has met the needs of your local community and children in the school and sufficiently solved the problems?

6. Do you have any ideas for how the project could have been better?

7. Do you have any other comments on the project?

With Architect Zhu JingXiang, who has participated in Xiuning Shuanglong Primary School project

Interview Time: 14th September 2018

Interview Place: Hong Kong

The interview with architect Zhu Jingxiang was made in Hong Kong as he is teaching in the Hong Kong Chinese University. The process of having the interview was dramatic. On the day of the interview, the researcher went to the architecture studio at the university; however, the architect had a last-minute change of plans and requested if they could conduct the interview while travelling to a meeting in Shenzhen. As a result, it was a unique experience to conduct an interview while walking or even on the metro. The interview questions were planned as following, related to process of humanitarian architecture in China, the involvement, and experiences of the architect in relevant humanitarian projects and his ideas on potential for improvement or change. However, the actual interview was carried in a kind of chatting format, the architect has given some information that more than expected.

1. Have you ever been involved in any humanitarian architecture projects?

2. If yes, what motivated you to do that project(s)?

3. If yes, can you share me your experience in that project, and is there anything you feel was particularly good or bad?

4. If yes, do you feel the time you spent and efforts that you gave are worthy after the project completion?

5. If yes, have you monitored the maintenance of the school after the project completion?

6. If not, do you know what humanitarian architecture is?

7. If not, do you want to be involved in humanitarian architecture projects in your further career plan?

8. What do you think about the overall situation of humanitarian architecture in China?

9. Can you give some suggestions about how to improve the process of humanitarian architecture in China and what do you think could encourage more humanitarian architecture projects in China?

10. What do you think are the current barriers to humanitarian architecture projects in China?

- **Interviews for Bridge School project:**

Interviewees: Bridge School Project Manager, Chen Jiansheng; Local villagers in Fujian Xiashi Village.

Interview Questions:

With Bridge School project manager, Chen Jiansheng through WeChat interviews:

Interview Time: 27th July 2018 & 31st August 2018

Interview Place: WeChat Interviews

There were twice interviews with the project manager of the Bridge School project, and all of them are WeChat interviews. The first interview was made before the site visit to the Bridge School, while the second interview was conducted the journey from the Bridge School, because there were more questions generated from the site visit. Overall, the interview questions related to process of the Bridge School project and the involvement of the project manager and his ideas on the project and future development of humanitarian architect in China. The project manager Chen was happy to have his name shown in the research.

1. What motivated you to be involved in this project (Bridge School), as it is a humanitarian architectural project in relation to schools in disadvantages communities in China?

2. At what stage did your involvement in this project begin?

3. During the process of the design, what information did you have about the potential users of the school?

4. Can you share with me your experiences during the project, and was there anything you feel was particularly good or bad?

5. How did you cooperate NGO (China Youth Development Foundation) and Government, as this is a project undertaking by China Youth Development Foundation?

6. During the delivery of the project, how did you persuade local community to accept these new ideas? For example, link the two traditional castles by a bridge room, etc.

7. Do you feel the time you spent and efforts that you gave are worthy after the project's completion?

8. Have you monitored the maintenance of the school after the project's completion?

9. Do you have any idea on the situation that the school is currently not used as a school anymore?

10. Do you want to be involved in humanitarian architecture projects again?

11. Who provided the design fees and your salary? Was it enough for the project? How does it compare with your normal business cases?

12. What do you think about the whole process of this project?

13. Do you have any suggestions for potential improvement?

14. What do you think could encourage more humanitarian architecture projects in China?

15. What do you think are the current barriers to humanitarian architecture projects in China?

16. Are you aware of any other architects undertaking humanitarian projects?

17. Are you aware of any other humanitarian projects? Any Schools?

18. What do you think about the cooperation system of humanitarian architecture projects in China?

19. What do you think about the overall situation of humanitarian architecture in China?

With local villagers in Xiashi Village

Interview Time: 23rd August 2018

Interview Place: Fujian Xiashi village

The interviews with local villagers in Xiashi Village, where the Bridge School locates were made informal. The local villagers were friendly and chatting, showing the researcher their Tulou residential home and even picked up Leechee for the researcher. The interviews could be described as chatting while information related to the villagers' experiences on the project, and their ideas on potential for improvement or change to the project.

1. What are your overall views about the school building project (Bridge School)?

2. Where you are aware that the school was achieved as part of a humanitarian architecture project?

3. Have you experienced any change in your life which comes from the designed school building? It could be something you feel good about or not.

4. Do you think the building designed has met the needs of your local community and children in the school and sufficiently solved the problems?

5. Do you know the reasons that why the school is currently not used as a school? What is the current usage of the classrooms?

6. Do you have any ideas for how the project could have been better?

7. Do you have any other comments on the project?

- **Interviews for Xiashan Primary School project:**

Interviewees: Xiashan Primary School Project Designer: Prof. Qin Luofeng; Head of the Xiashan Primary School; Parents of students in Xiashan Primary School.

Interview Questions:

With Xiashan Primary School Project Designer: Prof. Qin Luofeng

Interview Time: 26th September 2018

Interview Place: Hangzhou STI Studio office

The first interview with the chief architect of the Xiashan Primary School project, Qin Luofeng was carried out in the architect's office in STI Studio in Hangzhou. Interview questions were related to the process of the Xiashan Primary School project, his involvement in the project and his experiences, his ideas on potential for improvement or change to the humanitarian architecture in China. Because the architect completed his doctorate in Germany, he and the researcher have a similar experience, and the interview was conducted in more depth and lasted about two hours. While the second interview with the architect Qin Luofeng was conducted through WeChat, because the researcher had already returned to the UK at that time. And it was made with only two questions the researcher faced while analysing the research data.

1. What motivated you to do this project (Xiashan Primary School), as it is a humanitarian architectural project in relation to schools in disadvantages communities in China? We know it is a demolition resettlement project.

2. At what stage did your involvement in this project begin?

3. During the process of the design, what information did you have about the potential users of the school?

4. Can you share with me your experiences during the project, and was there anything you feel was particularly good or bad?

5. During the delivery of the project, how did you persuade local community to accept your ideas?

6. We know the project has two phases and the first phase has completed, then how about the second phase?

7. Do you know the current usage situation of the school?

8. Do you feel the time you spent and efforts that you gave are worthy after the project's completion?

9. Do you want to be involved in humanitarian architecture projects again?

10. Who provided the design fees? Was it enough for the project? How does it compare with your normal business cases?

11. How did you cooperate and communicate with government, as this is a reconstruction and demolition project carried by government?

11. What do you think about the whole process of this project?

12. Do you have any suggestions for potential improvement?

14. What do you think could encourage more humanitarian architecture projects in China?

15. What do you think are the current barriers to humanitarian architecture projects in China?

16. Are you aware of any other architects undertaking humanitarian projects?

17. Are you aware of any other humanitarian projects? Any Schools?

18. What do you think about the cooperation system of humanitarian architecture projects in China?

19. What do you think about the overall situation of humanitarian architecture in China?

Interview Time: 1st June 2020

Interview Place: WeChat interview

Questions related to the project phases of Xiashan Primary School.

1. Regarding the project time, could I kindly confirm with you the time for the two phases of the project? Are they June 2014 to April 2016 and 2017 to September 2018?

2. When was the project acceptance time? When I interviewed you in 2018, it was not fully accepted?

With Parents of students in Xiashan Primary School

Interview Time: 26th September 2018

Interview Place: Zhejiang Anji

The interview with a parent whose child is studying in the Xiashan Primary School was happened while the parents were waiting to pick up their children outside the school. The interview questions were related to their children's experiences in the new school environment and their ideas on potential for improvement or change to the school. The interview time was short, and it was obvious to appear in the research anonymously.

1. What are your overall views about the school building project (Xiashan Primary School)?

2. Where you are aware that the school was achieved as part of a humanitarian architecture project?

3. What are the changes the project gave to you and your families? Are they good or bad?

4. Do you think your child/children enjoy the new school?

5. Do you have any ideas for how the project could have been better?

6. Do you have any other comments on the project?

With the Head of Xiashan Primary School

Interview Time: 27th September 2018

Interview Place: Zhejiang Anji

The interview with the head of Xiashan Priamry School was happened in the head of school office within the school. The challenge is the school head requires no specific photos related to what the school representative talked about were allowed and to be anonymous in the research. In addition, the current school head who was interviewed joined Xiashan Primary School after the school had already been established, therefore he was unaware of the events that occurred during the school's construction period. Therefore, the interview questions focused on the current usage of the school and his ideas on potential for improvement or change to the school.

1. What are your overall views about the school building project (Xiashan Primary School)?

2. Where you are aware that the school was achieved as part of a humanitarian architecture project?

3. What do you think are the most basic needs of children in your school?

4. Do you think the building designed has met the needs of your local community and children in the school and sufficiently solved the problems?

5. Do you have any ideas for how the project could have been better?

6. Do you have any other comments on the project?

- **Interviews with other Architects who have participated in humanitarian architecture projects before:**

Interviewees: ***Architect Zhou Wen***, who has participated several humanitarian architecture projects in Cambodia with an NGO named Building Trust International in 2016 and 2017.

Interview Time: 29th September 2018

Interview Place: WeChat interview

The interview with architect Zhou Wen was conducted through WeChat. Interview questions related to the process of humanitarian architecture that he has taken part in, his involvement and experiences in the projects and his ideas on humanitarian architecture in China.

1. Have you ever been involved in any humanitarian architecture projects?

2. If yes, what motivated you to do that project(s)?

3. If yes, can you share me your experience in that project, and is there anything you feel was particularly good or bad?

4. If yes, do you feel the time you spent and efforts that you gave are worthy after the project completion?

5. If yes, have you monitored the maintenance of the school after the project completion?

6. If not, do you know what humanitarian architecture is?

7. If not, do you want to be involved in humanitarian architecture projects in your further career plan?

8. What do you think about the overall situation of humanitarian architecture in China?

9. Can you give some suggestions about how to improve the process of humanitarian architecture in China and what do you think could encourage more humanitarian architecture projects in China?

10. What do you think are the current barriers to humanitarian architecture projects in China?

4.1.2 Focus Groups

During the actual field data collection, the focus groups were finally given up due to sensitive attitude of the government at the time. It was aimed to gathered government officials, the architects, teachers, and parents, who are topic related people from the local community, then to refine the research questions from the interaction among them.

However, it cannot be achieved at the time, then the case study focused on individual interviews and observations.

4.1.3 Observations

The type of observation method adopted in this case study was participate observation, where observations were carried by the researcher during the day operation of the schools. The participate observation for the three cases usually took for 1 to 2 days.

As both the Xiuning Shuanglong Primary School and the Xiashan Primary School are running normally, the physical behaviours and gestures of the students, include what they do in the school, who does that, the interaction between teachers and students, students and students, and their emotions were observed without any destruction from the researcher. Any people who stand out, their characteristics, what they do, what differentiates them from others and their emotions were recorded as well.

However, the Bridge School is no longer to be used as a school, therefore, the observation for the Bridge School projects focused on the local community and local villagers, including their behaviours and how they use and interact with the building. The video records, radio records, photograph records and field notes have been made during the observations.

4.1.4 The Practical Challenges during Field Data Collection

A range of factors influenced sourcing information for the research. These influencing factors can be classified into three categories:

(i) availability of key contacts.

(ii) access difficulties; and

(iii) on-site changes.

The first key influencing factor is related to the availability of key contacts for each of the case studies. For the first case study, the Bridge School project, the chief designer, and the China Youth Development Foundation refused to be interviewed and this meant that less information was available for the research, so changes to the research plan were made to source alternative information. An interview request was sent twice to the chief designer with no reply, while one of his students passed on his refusal to be interviewed on his behalf. In terms of the China Youth Development Foundation, due to their policy limitations, they cannot provide information on specific projects, related to donors and funding. However, interview requests for general information were also ignored by their administration. Ultimately successful interviews with the project manager and local villagers and additional literature reviews on the projects compensated for the lack of potential information and data. Compared with the Bridge School project, more key people were available for consultation for the other two cases, however, challenges

there were still a number of challenges. For the Xiashan Primary School project, an interview with the chief designer was successful, where the chief designer also provided useful information related to his conversations with the government. Informal interviews with parents were also possible. Although the representative of school refused to be interviewed in the beginning, later an interview was agreed to. In terms of the Huangshan Xiuning Shuanglong Primary School project, the contact with designers WSP Architects was smooth, the chief designer accepted the interview request and helped make contact with the architect Zhu Jingxiang, who guided opinions the project. As the "humanitarian" topic was sensitive and political for the local government, it was difficult to carry on formal interviews with the local government officials and the school administrators so instead more informal interviews were undertaken. The local government officials helped to make contact with the school head.

Access difficulties was another key factor to deal with when conducting the case studies. Firstly, the three cases are in three different geographic locations within China, and therefore a structured travel plan with times and travel methods was needed. Also, all of the places were unfamiliar to the researcher, although they are in the researcher's home country. In addition, both the Bridge School and Huangshan Xiuning Shuanglong Primary School are located in mountainous areas, it was a challenge to actually find them. Luckily, a friend from Zhangzhou drove the researcher to the Bridge School site, however, upon arrival at the site, it suddenly rained very heavily and the person who held the key for the upper classrooms was not in the village, therefore, the interior of classrooms was unavailable for access. While the local government officials did not

give permission to enter the school, finally they brought the researcher to the Huangshan Xiuning Primary School. As for the Xiashan Primary School, the researcher went to the campus twice, for the first time, without permission to go into the campus, only outside observation was made and informal interviews with parents who came to collect their children was undertaken. For the second time, although the researcher went into the campus successfully, she was not allowed to visit inside the school.

As the researchers are external to and not in control of a case study site, it is necessary to be prepared for relevant things to change when visiting the site. For the Bridge School, due to the weather problem and locked classrooms, less access to the interior meant less information was obtained. However, when making a research plan, the weather is not always predictable. The locked situation for the classrooms was not predicted by the researcher and therefore plans had to change when on site. Another on-site challenge for the Bridge School project was the language problem. People in the village speak a local Southern Fujian dialect, but the researcher can only speak Mandarin, ultimately the friend who drove the researcher to the site acted as a translator when communicating with the local villagers. When visiting the Xiashan Primary School and having the interview with the school representative, no specific photos related to what the school representative talked about were allowed, however, fortunately the chief designer had provided sufficient images and information.

Lessons learnt from the Field Data Collecting Experiences:

There are a range of lessons that have been learned from the case study data collection experiences in this research project. These lessons involve both the changing of external factors and individuals. Firstly, a researcher needs to be as prepared as possible for elements to change and to be aware potential external influences upon the case study site. There are always unpredictabilities such as those which are related to availability of key contacts, and political sensitivities amongst others. It is also necessary to mention the experience during the interview with architect Zhu Jingxiang in the Hong Kong Chinese University. The researcher went to the architecture studio in the university on the day to have the interview, however, the architect had a sudden change of plan and asked if they could have the interview on the way to an appointment in Shenzhen. Thus, it was an interesting experience that involved having an interview while walking and even on the metro. Secondly, participants in the case study all have their own personalities, and these all should be considered and reflected in the research. Thirdly, the political sensitivities can also result in access and information difficulties. In addition, a well-structured schedule and travel plan is important, and the researcher will benefit from these. Finally, it is essential that very careful and comprehensive field notes are taken for the research.

4.2 Discussion and Comparison of the Three Case Studies:

The research data will be processed under "case-by-case" structure below.

Case 1- Bridge School:

1) Introduction of the project.
2) Project Inception: Project Initiation/ Motivations and Rationale for the Projects/ Funding Mechanisms. (Where the fees came from? How they did, sufficient/not?)
3) Process Realization: Engagement and Communication. (with local community)/ Co-operation Process and Partnerships. (with NGOs/government/local community)/ Project Implementation and Phases. (one/two phase(s))
4) Post Construction: The Impacts of the Projects. (impacts on education/local/society, etc. and whether solved potential problems?)/ On-going Utilisation of the Projects/ Post-completion Maintenance and Management. (Who is responsible for the post-maintenance?)

Case 2- Xiashan Primary School:

As above.

Case 3- Xiuning Shuanglong Primary School:

As above.

Finally, conclusion and comparison of the three case studies will be summarized.

4.2.1 Case 1- Bridge School

1) Introduction of the Bridge School Project

Project Name	Bridge School
Architect	Li Xiaodong Atelier, Beijing, China
Project Team	Chen Jiansheng, Li Ye, Wang Chuan, Liang Qiong, Liu Mengjia, Nie Junqi
Building Contractors	Zhangzhou Steel, Xiashi village

Table 24. Basic information of the Bridge School project (Slessor, 2009)

Project Name	Bridge School
Structure	Steel
Foundation	Concrete
Decking and sun-shading slats	Timber
Basic construction technology	Prefabrication and on-site construction
Innovative structure system	A truss-box and suspended bridge

Table 25. Structure information of the Bridge School project (Li, 2009:03)

The Bridge School is a two-classroom school designed by Li Xiaodong Atelier. It was constructed in 2008-09 in a remote village of Xiashi in the mountainous area of Pinghe County, Fujian Province in southeast China, which is a 460-year-old small village that lies 1,000 metres above sea level. It is a typical rural village in Fujian Province. The surroundings of the village are mountainous. “The traditional houses, now mostly abandoned, are of mud walls and tiled roofs set along the contour lines of the undulating

landscape. These are of heavy wall construction with timber doors and windows nicely disposed like terraced housed in some parts." (Mallick, 2010:02).

Figure 9. Villagers using the steps, slide, and places underneath the Bridge School for play and leisure (Photograph by author)

When the project was launched, there were 300 families with a poor population of 700 in the village. The main occupation of the villagers is grapefruit farming. Landscape of the village has been changing at that time. "Not many people live in the traditional earthen walled and tiled roofed housing. Concrete frame structures with brick infill are the trend of the day. With modernisation the traditional structures are giving way to concrete building. Quite a few concrete buildings exist and operate as houses and

businesses and several of them are under construction. These new structures are yet to take over the village as the predominant form, but it seems likely that they may in the next few years. The road to the village is paved but the inner pathways are mostly earthen and sometimes stone paved" (Mallick, 2010:02). Most of the buildings in the village are scattered with single or double stories, except those buildings around the earthen building. There is a creek running through the village, which has been spanned by the Bridge School and there are two earthen buildings on each side.

Figure 10&11. The mountainous area passed by on the way to the village (left) and the grapefruit farming in the area (right) (Photographs by author)

Figure 12. The residential housings surrounding the Bridge School (Photographs by author)

The earthen building, Tulou is a fortress-like housing rises to four storeys (15m) in height from 17th century. They housed large extended families within the thick circular earthen wall with peripheral living quarters and a central community space. These two earthen building used to belong to two rival families, however, as time goes by, the rivalries are gone and the earthen buildings are nearly abandoned, the rivalry has gone along with it. Thus, the Bridge School acts more like a symbol of truce (Mallick, 2010:01). Although the outer mud walls of the two Tulous still remain in very good condition.

Figure 13. An exterior view of a Tulou earthen residential building (Photograph by author)

This Aga Khan Award winning project is a charity project that was sponsored by both private and government funds. It is a typical case in the provision of schools for the disadvantaged communities and it provides both physical (a school and a bridge) and spiritual (a spiritual centre) functions to the local community. It forms a bridge over creek between two earthen buildings, containing two classrooms, a playground for children and a stage for the villagers, which aims to link the past, present and future. "The village is fast losing its traditional character. The Bridge School, although modern, is politely so and sensitive to the scale of the village." (Mallick, 2010:02)

Figure 14&15. Interior views of a Tulou earthen residential building (Photographs by author)

2) Project Inception

The Bridge School project was initiated and designed by architect Li Xiaodong and project manager Chen Jiansheng in 2008. Where Chen Jiansheng is a senior year student of the architect. He had originally identified the need for the project. It was to be fully funded at the beginning by a personal donor, but finally completed in cooperation with an NGO, the China Youth Development Foundation (CYDF) due to financial difficulties. In an interview with project manager Chen (2018), the Bridge School project was initially to be fully funded by a Singapore-based friend of Li Xiaodong through a 500,000 RMB public welfare fund donation. However, due to financial difficulties, only 50% (250,000 RMB/$35,000) of the project could be funded, resulting in the need to find another sponsor to fund the remained to ensure completion of the

project. According to Hong and Li (2019:134), to ensure the later operation as a 'Hope Primary School', the CYDF will require 50% of the funds from donors and another 50% from the local government. The Hope Primary School project was launched by the CYDF in 1989 as a public welfare initiative in China, whereby the building of primary schools and funding the disadvantaged students became two major public welfare projects (Hong and Li, 2009:134). The Bridge School project was later implemented as a charitable project by the CYDF, with the initial private donor providing 50% of the funds through the CYDF and the local government funding the balance. The local government could not make available funds for the entire building- they only came up with half the money that was needed. The architect then embarked on raising the rest. He was successful in getting a sizeable donation from a film star friend in Singapore, and he donated the rest himself (Mallick, 2010:03). In fact, the entire construction cost of the Bridge School was around USD 100,000 (RMB 650,000). Cost/m2= USD 300 (RMB 2,025) including landscaping and site preparations. The cost per square metre is higher than conventional school buildings in that area by about USD 50 per square metre (Mallick, 2010:07). Where the Bridge School project is a fully charitable project, the salary for project manager was paid by Li Xiaodong Atelier and there was no relevant to the project funds.

Budget control and construction method are the main limitations of the design. Initially, the budget of the whole project is RMB 500,000, however, due to tight construction space and disadvantaged road condition, it is difficult to maintain original budget for a steel structure (Li, 2009:03). According to project manager Chen (2018) in an interview,

hoisting was extremely difficult when dealing with the steel structures, because the span is very big, which is 27 metres without any supported in the middle. Moreover, there is a small river hanging underneath the classrooms. The two main beams had to be welded on site in that limited space. All the relevant work, including importing materials, transporting the steel structures could only be operated in the limited space in front of the earthen buildings.

The rationale behind the Bridge School project is complicated. The Bridge School project was initiated by firstly demand of a Hope Primary School in the Chinese countryside and secondly a research project on "acupuncture approach" of community living through design (Li, 2009:04). Its design concept is derived from the local earthen residential buildings that are widely recognized worldwide from architectural image. This concept was introduced to make the project more "meaningful" (Interview with Chen, 2018) and respectful of the local context. Its main concept of the Bridge School project is to achieve social sustainability by utilizing architectural intervention, which means to reactive the local community and to sustain the traditional culture through a contemporary language with respect (Dezeen, 2009).

At that time, Li had already had an architectural design like this in China. In a casually talk with Professor. Li, Chen said that there were many poor villages in his hometown, Fujian province, maybe it would be appreciated to do such a thing there. Although Professor. Li did not understand the Chinese countryside very thorough as he stayed

abroad for a long time, he thought it would be feasible to do this thing with a local Fujianese to help with the children in poor mountainous areas. Thus, Li told Chen very seriously at the time: "Okay, you go to see if there is such a place?" (Interview with Chen, 2018)

Out of a passion that had not actually done a real project as an undergraduate, Chen really hoped this thing can be promoted. Then he contacted the people in his hometown to help find suitable poor mountain villages and see if they needed such a project. The local town government was very interested, and then they collected some information about several typical remote mountain villages. However, Professor. Li believed that such kind of mountain village was everywhere in China, and if they really want to do something in China and make it more meaningful, they should look at it from another angle, which means that it might not be enough to simply use poor mountain village as a background. Then the concept of the earthen building that is widely recognized by the whole world was introduced (Interview with Chen, 2018).

These earthen buildings known as “Tulou”, are typical rural dwellings common to southeast Fujian Province between the 12th to 20th Centuries. They are commonly of square or cylindrical plan, between three and five stories in height and constructed of very thick load-bearing rammed earth walls. This fortified residential building form was used as a residence by a single clan or a group of families. As a local, the project manager had in recent years seen many of these traditional buildings being demolished

and was impressed with the "contextually appropriate proposal" for the Bridge School (Interview with Chen, 2018). Coincidentally, in 2008 there was also an application to gain World Heritage Status for the Tulou rammed earth dwellings.

Figure 16&17. Selected site with two "Tulou" residential buildings for the Bridge School project (Photographs by author)

In terms of the planning process for the Bridge School project, according to the guidance of the China Youth Development Foundation, for schools that meet the requirements for applying to become a Hope Primary School, the local county government will apply to the China Youth Development Foundation through the Provincial Youth Development Foundation and fill in the "Application Form for Funding Projects for Hope Primary Schools." Then the China Youth Foundation will form a special review team to be responsible for the review of the aided schools. Under the guidance of the principles of fairness, openness, impartiality and transparency, the aided schools are determined through the review system. "Notice of Eligibility for Funding Conditions" will be sent to aided schools by the China Youth Development Foundation to inform the Provincial Youth Development Foundation, and the Provincial Youth Development

Foundation will notify their county government. Within the stated time frame, local governments and the Provincial Youth Development Foundations are required to complete, sign, and return the "Planning and Design Letters for Funding Projects for Hope Primary Schools" to the China Youth Development Foundation. The county government assumes responsibility for the management of the Hope Primary School's construction project, including planning, design, progress, funding, quality, and construction safety. The construction management of Hope Primary School implements a monthly project progress report system. After completion, the Hope Primary School will be managed by the local education department.

The architect Li Xiaodong regards the project as a social community centre for the local village, rather than just a normal school. The main idea is to keep physical lightness and spatial fluidity (Slessor, 2009). The building interacts with its surrounding in all dimensions by introducing "a new typology of space and a multifunctional program" (Li, 2009:04). According to Mallick (2010:04): "The architect compares his objectives to that of 'acupuncture' where the treatment is not only for a local medical problem but healing the body as a whole. This translated into architectural thought would entail finding the right spot for the building that would not only solve the problem of not having a school, but one that would also unite and rejuvenate the entire community by its presence."

The initial project outline was framed together with the school representative, head of local village and the architect, in which there should be two classrooms for 35-40 kids, a small public library and a bridge for the local villagers. While a playground, open public spaces and stages were added later during the design development (Li, 2009:04).

"There was the need for a primary school in the village for which no specific site was allocated. The architect looked at the project not only as a school but also a building that would rejuvenate the entire community through the creation of a setting for the school. The creek physically divides the village and there had been no crossing over it for a long time. A concrete bridge had been built downstream from the school's location some years ago. The school could also be a bridge for the community separated by the creek as a symbol of unification of the community." (Mallick, 2010:05)

3) Process Realization

In terms of project realization, project manager Chen (2018) emphasised in an interview that: "I think the biggest barrier to do such a humanitarian project in China is the locals. As they are party A, they are the owners. You must have enough confidence and time to communicate with them to let them understand and support you. This is the key point of the whole project. Because if they do not understand you at first, they will not cooperate with you. If they have not understood, supported, or realized how the project would be in the future, it is difficult to build up a favourable long-term operation." He also reflected on how "We all took it for granted, so encountered several problems that were not easy to solve. For example, we did not reach an agreement with the villagers on the surrounding old houses at the beginning, and then had to work in a difficult environment. Finally, the local government helped us to slowly coordinate, and

removed the surrounding old and some unused houses. Then we were able to create the space".

These challenges were reflected in the early stages of the Bridge School project due to a lack of adequate communication with the local villagers. According to an interview with Chen (2018), when he first finished the design of the Bridge School and came back, he only focused on how to implement the project very soon, but with no experience, which encountered a lot of problems, such as old building demolition and some on-site problems. Then there was not enough time communicating with the government. The government knew that the project was a charitable public welfare project, but due to unfortunate propaganda, most of the locals and people in the surrounding villages thought it was a commercial tourism project, funded by an investor trying to exploit the visitor potential of the indigenous earth buildings. This misconception, amongst the villagers, made it extremely difficult for them to deal with matters related to some of the old derelict houses in the area. Assuming the investor had considerable funds available, the local villagers did not cooperate and demanded many requirements. Despite, the houses involved having already collapsed, or being of very poor construction quality, the villagers were focused on financial compensation. The government was enthusiastic at the beginning, but later, when they found there are so many problems, it was also very difficult to cooperate with the government. The public welfare awareness of local government officials was not strong. They saw this project has no profit and thought it to be a very ideal job, in which they need to spend a lot of time but cannot get any benefit. Many officials of the government, they all value reality

like this: Is it a foreign business project? What are the achievements of them? (Interview with Chen, 2018) But at that time, the personal donor had not transferred the project funds, which caused the slowness of progress. As a result, the design team soon realized the importance of having smooth communication with the local community. Project manager Chen therefore explained the project to the local village officials and built up a closer relationship with them including enabling them to engage with the project through the development process. This gained the trust of the villagers as they began to understand the intentions of the project (Interview with Chen, 2018).

Figure 18. The grocery store beneath the Bridge School (Photographs by author)

One significant change to the initial project design because of community engagement was the creation of a grocery store beneath the Bridge School. This had originally been

planned as an admissions room for the school. This involved the relocation of a small grocery store opened by an old woman in a very small old house next to the project site. In an informal interview with the owner of the grocery store (2018), she stated that she would not have moved without this concession to the school design and in fact didn't leave her existing store until the new building was completed.

During the design phase, the government required that the village retained two classes within the school and as such, two classrooms were provided in the completed project. However, after a free in-depth investigation and evaluation of the project, by a local cooperative design institute in Xiamen, it was considered that the layout of the Bridge School was insufficient to meet the requirements of a primary school and did not meet the China's specifications for primary schools. According to China's Primary and Secondary School Design Code GB50099-2011, primary and secondary schools should be built in areas suitable for construction with sufficient sunlight, air flow, dry sites, unobstructed drainage, and higher terrain. The school should be equipped with sports venues and provide basic municipal facilities. Elementary and secondary schools are strictly prohibited from being constructed in areas with high natural disasters such as earthquakes, geological collapse, underground rivers, floods, and high man-made risks and areas with excessive pollution. Additionally, full elementary schools in cities and towns should have a service radius of 500 metres. The regulations also provide specifics on classrooms and safety measures. Relevant rules must be fulfilled while designing humanitarian school buildings. Nevertheless, the architects hoped that it could still function as a primary school in the future and therefore named it Bridge School.

In addition, although local site mapping was commissioned when the team designing in Beijing, the information they could get was limited. Therefore, when project manager, Chen Jiansheng returned to Fujian to start construction on the site, the design did in Beijing was almost changed. There was a very big difference, from the location, the infrastructure of the venue, to the surrounding space, all were made appropriate adjustments. “When I returned to Fujian, I found a lot of problems, including design-related issues, and engineering calculations” (Interview with Chen, 2018). The main structure of the building was steel, which is not local technology, but was considered “appropriate for its strength and economy of size, durability and ease of maintenance”. “The components of the trusses and the frames were manufactured elsewhere and assembled locally with specialised equipment and labour brought in by the contractor” (Mallick, 2010:07). However, all the woodwork is obtained and assembled locally. In an interview with Chen (2018), he pointed that “When dealing with the steel construction, hoisting was pretty difficult because the structure was very large, spanning 27 meters and there was no support in the middle but with a small bridge hanging, so the two main beams had to be welded on site and then lift in a limited space.” A 16-ton and an 8-ton crane were used together to carry on the work. However, the 16-ton crane was too long and big to drive in site from the narrow bridge. It was from a small road now, which was originally a small garage. Money has been spent to manage that road. Moreover, “as the workers sent by the factory only had work cooperation with us and did not involve any funds. We took out 2,000 RMB from our project department as an encouragement for the workers to make them do details of the steel structure better,

stronger and safer" Chen (2018) represented in the interview. Then after a few friends introduced, they had to cooperate with a design institute, Hedao Architecture design in Xiamen, letting them help to calculate the steel structure and basis. In fact, they have made a lot of changes in halfway (Interview with Chen, 2018).

"The cooperation with charitable organizations is mainly tracked by Professor, Li. At that time, he was in contact with CYDF in Beijing, as on the Fujian side, only the local county government was in contact with us" (Interview with Chen, 2018).

Due to the untimely release of funds, on-site construction even stopped. "Sometimes when you encountered some small problems that are scattered and scattered, even if you communicate with the county magistrate, the county magistrate can't manage it in detail and the relevant staffs did not cooperate well, the actual work is particularly difficult to carry out" (Interview with Chen, 2018).

"If you are doing such a public welfare project in China, firstly, there must be a dominant. A team is enough to analyse a problem, to solve and finally to implement it very well. Second, funds must be under the control. Because only when you grasped the entire fund, you can have the confidence to design. Meanwhile, you must have enough decision-making ability to deal with all the matters. Finally, the most important thing is that this design team must be good at moving around, not always staying in the office. There should be enough time to sit with the local government, the villagers, or

some other related personnel to communicate with them." Chen (2018) stated in an interview.

4) Post Construction

Since completion of the project, it has become both physical and spiritual centre of the village and attracted major attention in the society as an important example for social sustainability of rural communities (Li, 2009:04).

Compared with the standard school typology, the arrangement of corridor and classrooms for the Bridge School is different, with gallery type classrooms and ergonomic measurements.

After the completion of the Bridge School project in August 2009, it did open as a school for a short time, however, in 2010 the two classes in the village moved out of the village and joined a nearby primary school. This move to the Central Primary School of Qiling Town was conducted under the legislation for the 'Movement of School Closures and Mergers'. Thus, the local children only studied in the Bridge School for a short period of time and symbolically the Bridge School then became a public reading room (Interview with Chen, 2018). Although the Bridge School is no longer used as a school, it has become a significant structure within the village and a much-needed leisure space for the villagers. Even the small bridge, hung from the school building above by a rope structure, under the Bridge School has become an important local place

for groups of old people to congregate on small wooden tables and chairs underneath the original classrooms. This place provides a beautiful natural setting that is protected from the rain and the elderly villagers sit on wicker chairs or the bench in front of the grocery store (original admissions room) in twos and threes chatting before going home at dinnertime. The Bridge School's drainage system is also a local feature with the rain being collected before falling dramatically into the small river below.

Figure 19. The elderly villagers sit chatting on chairs or the bench in front of the grocery store (Photographs by author)

Figure 20. The rain being collected before falling dramatically into the small river (Photographs by author)

Figure 21. The elderly people end their chatting and return home to cook dinner as dinner time approached (Photographs by author)

Figure 22. The children are playing and having fun on the slides and steps leading up to the Bridge School (Photographs by author)

There is also a small open space next to the Bridge School, where children in the village would chase the chickens and play and have fun on the slides and steps leading up into the school building. These slides and steps were ergonomically designed for small children, and this has clearly resulted in their successful adoption.

Soon after the completion of the project, mainly due to the publicity of its Aga Khan Award for Architecture 2008-10, many people, including foreigners, came to visit which in turn assisted with the economic development of the village. Because of the establishment of the Bridge School, a bridge was built between the two significant family homes ("Shi" and "Lin") on either side of the river, which created a convenient passage across the valley for villagers. The name of the Bridge School is "book" in Chines (桥上书屋), since the Bridge School became a reading room after the school

moved out. However, the actual situation is that the villagers do not use the building itself, and unless the tourists request to visit, the door is kept closed. The building does, however, provide an important leisure space for the villagers and a means of crossing the creek. According to the owner of the grocery store in an informal interview (2018), the reason why Bridge School is not used as a school is that there was little for such a school in the village. Indeed, most of the people who live in the village are old and most young people have migrated to larger towns and cities in search of employment. Although some children remain and live with their grandparents there are sufficient primary schools nearby. The Bridge School therefore now plays more of a role as a community place and as a link between the two halves of the village. Despite, not achieving its desired objective of providing a new school facility, or indeed a well-used internal space, the Bridge School does re-activate the village and the surrounding environment. Its own function as a 'bridge', including the relationship with the surrounding earthen buildings has been a success (Interview with Chen, 2018).

"In fact, when we did this project, almost no one had lived on either side of the earthen buildings, and most of them moved away from the river to nearby roads to renovate their new houses. Our aim was to reactivate the space between the two earthen buildings, and let the locals look back at their history or redefine the space. We did not consider whether there would be any specific impact on the locals at that time, because a space, a design, once it is sited into a certain extent, will have an impact. Once this space was liked or loved by people, the space will slowly be developed meaning." Claimed by Chen in an interview (2018).

The Bridge School plays a role as a link. It does not mean that the space inside the Bridge School can function differently. More is, it re-activates the surrounding environment and space. Its own function as a bridge, including the relationship with the surrounding earthen buildings, is the core of the Bridge School (Interview with Chen, 2018).

Figure 23. The Bridge School links the two earthen buildings as a “bridge” (Photographs by author)

The initial costs of the post-construction maintenance and management of the Bridge School came from the funding received for the Aka Khan Award for Architecture prize. This funding, however, only lasted for the first three to four years after the project’s completion in 2008. Subsequently, maintenance has been neglected with the local government reluctant to fund repairs and the local villagers unable to do so. As such, there is a realistic danger of the commendable outcomes of the project now encountering problems that will impact upon its future success as an important central place and

facility within the village. Also, the continued demolition of many old houses together with the construction of new dwellings is affecting its local context.

The project manager Chen (2018) lamented in the interview that: "I hope that the locals can understand that I cannot help them for a long time and that the government can also 'see' this project, because if the local government does not take the initiative to maintain it, we can't do it for next ten or twenty years. We do not have that much energy at all. After all, it is a public welfare project." In fact, the Hope Primary School will be managed by the local education department after it is completed. Therefore, when the project was completed, there was a completion ceremony, which was an official handover of the school to the local government. "The government officials will change, but the locals have been involved in the whole project all the time, so the locals play the most role" (Interview with Chen, 2018).

"Designing in China, no matter where it is, most of the places may have such problems. At the beginning, there might be a flash point in a short time. It may be very dazzling, but to continue is the most difficult thing. In fact, a design should have a lot of interesting things happening in the follow-up, but there are always many things happened with resistance to the post-maintenance, such as some negative actions from the local people, the government, even the rhythm of the entire society. For this project, I would not worry it getting old, because it tells a kind of attitude. I hope the government can really pay attention to it" stated by Chen in the interview (2018).

4.2.2 Case 2 - Xiashan Primary School

1) Introduction of the Xiashan Primary School Project

The Xiashan Primary School designed by STI Studio, Architectural Design and Research Institute of Zhejiang University, and Department of Architecture, Zhejiang University was completed by 2008 in Lingfeng area, Anji County, Zhejiang Province, China. It is a resettlement primary school project to solve the social problem of the reconstruction and demolition of the settlement, which is “to replace the existing temporary school buildings and to accept the children whose parents are the residents in resettlement residential area” (ArchDaily, 2017). This project was completed from “garden” to “yard”, which began with the idea to build a spiritual “home” for children and the methods "enclosure" and "reorganization" used to organise the teaching space and auxiliary space.

Figure 24. The view from main entrance of the Xiashan Priamry School (Photographs by author)

The project has two phases, where the first phase has been completed in April 2016. According to the architect Qin Luofeng in an interview (2018), the basic completion of the final phase had already been finished, but the project still had not go through the final acceptance until September 2018. The government would renovate some of it and add underground parking under the large playground.

2) Project Inception

Unlike the Bridge School as a charitable project, the Xiashan Primary School is a government demolition and resettlement project. It is a public welfare project which is initiated, sponsored and operated by the local government. As part of the overall regional planning, the government commissioned Professor Qin Luofeng from Zhejiang University to complete the project. Professor Qin has completed many projects in Anji, and his design team, STI Studio has undertaken many large regional planning with lots of village renovations across the whole Ring Mountain area, including the overall planning of Xiashan Village (50 square kilometres).

The architect Qin Luofeng pointed in an interview (2018) that: “perhaps from the perspective of Party A, they do not think it is public welfare or what. The starting point may be a task, rather than from the perspective of society. In fact, sometimes we do not have much purpose in China.”

Anji is place with natural beauty advantages, however, although the greening of Anji is good, it still needs more sustainable development in the future. In fact, there is the famous 'two-mountain theory' of President Xi in Anji in 2018: "Guided by the conviction that lucid waters and lush mountains are invaluable assets, the country advocates harmonious coexistence between humans and nature, and sticks to the path of green and sustainable development."

In the comprehensive planning of the area, the road would be rebuilt, many hotels would be created, and the old Lingfeng Temple would be renovated with the money from selling land for development (Interview with Qin, 2018). The original Xiashan Village had already been demolished, and the villagers were relocated to another piece of land in resettlement houses, leaving a small piece of land to rebuild the school and solve the educational problems faced by the children. The motivation of Xiashan Primary School project was to rebuild a school mainly for 'demolition and resettlement' residents to solve their educational problems. However, when the new school was built, the children of residents who were new to the area were also welcomed.

Figure 25. The old Xiashan Priamry School in 2014, which named “Lingfeng Primary School”

(Photographs by STI Studio)

Figure 26. The surroundings of the old “Lingfeng Primary School” in 2014 (Photographs by STI Studio)

Figure 27. The surroundings of the Xiashan Priamry School in 2018 (Photographs by author)

As a government 'demolition and resettlement project', the Xiashan Primary School was fully government funded, using the proceeds from land sales and "the government directly handed over the project to us, and there were no others in the middle" according to Professor Qin in an interview (2018). The design fee for this project was 30% to 40% lower than typical projects (Interview with Qin, 2018). In fact, most of the design fee went to the engineers of the Architectural and Design Institute of Zhejiang University for their cooperation. It took more than two years to complete the Xiashan project, as the money was obtained step-by-step through the sale of land for development with each stage only commencing as funds were received. There are two phases of the Xiashan Primary School, which are 06/2014- 2017 and 2017- 09/2018. The oveall cost of Xiashan Primary School was very low, around 2000-3000 RMB, up to 3000-4000 RMB per square metre, for the entire construction and fit out (Interview with Qin, 2018).

3) Project Realization

Professor Qin Luofeng of Zhejiang University was commissioned to execute the project as part of the larger regional planning. As a demolition and resettlement project, the project had the cooperation of the local government. "We have done a lot of projects in Anji. Party A is very respectful to us. We had a good relationship with their committee at the time, we were very trusted in the process of approval. Basically, they approved our plan directly and did not need too much process. The planning application approval process was relatively smooth" stated by Qin in an interview (2018). The government had little intervention in the project, only intervening to require minor adjustments, such

as opening windows. At the beginning, STI studio submitted an initial plan to the government on how to design the school. At that time, as the plot was not delineated yet, the government considered several different options, including whether to build the school on several small plots or a whole large plot. After the plot was finally determined, they decided on the planning and finally settled for one site for the school.

Figure 28. The surrounding resettlement residential buildings around the Xiashan Priamry School in 2018 (Photographs by author)

The context around the school was relatively messy as it neared the main road and was surrounded by the resettlement residential area. The villagers had opinions on this design as well. For example, they did not want the teaching building in the north, as it would be too far for them to collect their children. They also did not want the sports

building to be near to the road, and they did not want the playground on outside because they thought it would be too noisy. However, these were not in line with the initial ideas and therefore, it was necessary to hold discussions with the local villagers. These were not undertaken directly by the STI studio and, instead as a government project, the government did this themselves. Thus, the site location is a result of communications and discussion with the local villagers and as a result, the architects revised the plan.

Unlike most of current architecture projects in China, STI Studio participated in the Xiashan Primary School project from the beginning to the end, from design drawings to construction drawings, until the project completion. Professor Qin explained in an interview (2018) that STI Studio is responsible for both the drawings and the supervision of the construction phase of the project. In China, construction is not usually supervised by the architects, but in this project, all the construction problems were solved by the architects. The engineers also went to the construction site regularly, helped to monitor and solve the problems until the construction was completed, which is typically outside of the architect's responsibilities in China. The registration of STI Studio is under The Architectural Design and Research Institute of Zhejiang University, and the design of the structure, water and electricity of the Xiashan Primary School project were all coordinated by its engineers.

The land area of the Xiashan Primary School is about 20,000 square metres in total, while its construction area is about 10,000 square metres surrounded by mountains.

Thus, it is a challenge to introduce natural elements into the design. The design team obtained inspiration from the traditional Chinese garden design, “opened frame and visual corridor in some places of the enclosed yard space, which made the closed patio space do echo with mountains and contact each other” to communicate with the natural scene and extend the mountain landscape (ArchDaily, 2017).

Figure 29. The concept “from garden to yard” for the design of Xiashan Primary School. The traditional Chinese garden (Photographs by STI Studio)

Figure 30. The main entrance of Xiashan Primary School (Photographs by author)

4) Post Construction

The Xiashan Primary School did not begin as a public welfare project, but it now has a public welfare impact. Indeed, it has now been renamed as "Anji County Experimental Primary School - Lingfeng Branch". A parent (2018) whose family lives in the demolition and resettlement housing indicated that the children really like this new school as it is beautiful, the facilities are new, and it is convenient compared to the previous school. With the completion of the school and the new roads, the traffic is much more convenient, and the number of students has also increased. She also mentioned that the housing price was very cheap when she first came Anji in 2005, but now with the development of Anji Tourism City, the housing price is already very expensive. Overall, the villagers are satisfied with the demolition and resettlement houses. The school is also located very close to the demolition and resettlement houses.

A representative of Xiashan Primary School (2018) gave some feedback on the current usage of the school. The school was officially put into use in September 2015 with six year groups and three classes in each year, but it has now expanded to five classes in some year groups. The number of students has increased a lot and there are now 22 classes totally. The school has now been used for more than three years and the final phase of the project was completed until September 2018.

Some design issues that have gradually emerged after it was put into use. Firstly, there are large special-shaped windows, but the locations of some of them are very high which causes rain and snow to enter the corridor and when the rain is heavy in the summer, water will accumulate. For example, heavy rain in the Summer of 2017, caused the entire dace classroom floor on the ground floor to be flooded. Also, in the winter, the snow will freeze, and it becomes slippery, which is dangerous for teachers and children. The corridor connected to the second-phase teaching building on the second floor always freezes in the winter, which results in laying temporary mats or closing that corridor to avoid any dangerous situation. Secondly, as the teaching buildings are designed with a flat roof, the walls need to be plastered every year because of rainwater leaking into the building. In addition, the natural light in the classroom is insufficient to meet the daily learning requirements of the students, thus the lights need to be turned on during the daytime, which has increased the overall energy consumption. Moreover, during the fieldwork it was noted that there are sound problems due to the hard surfaces

of the interior design. Even during class, the reading sounds of children in the classroom will reverberate throughout the building, and the noise will be even greater after class. However, the representative of Xiashan Primary School also mentioned in an interview (2018) that although there are some design problems of the building, this is a very satisfactory school overall, from the beauty of architecture to the acceptance of the students.

At present, the school is not just serving children who are relocated to the new housing. Indeed, there are now five ongoing residential developments around the school, and the school will serve the needs of all surrounding residential groups in the future. As the Xiashan Primary School is a relatively new project, the final phase of this project has just been completed in September 2018, so there has been little need for post-construction maintenance and management apart from dealing with the issues of rain and snow mentioned above.

Figure 31. The interior view of Xiashan Primary School with flat roof and large special-shaped windows (Photographs by STI Studio)

4.2.3 Case 3 - Xiuning Shuanglong Primary School

1) Introduction of the Xiuning Shuanglong Primary School

The Xiuning Shuanglong Primary School completed by WSP Architects in 2012 has won 2012 China Architecture Media Awards and the WA Award Cycle 14. It locates in Huangshan, Anhui Province, China, where is the hometown of chief designer Wu Gang. The architect has advocated in rural public welfare projects for many years. The school

includes a reconstructed building and a new building with 7 classrooms and activity spaces. The whole land area is about 3420 square metres. The location of the school leans against mountains and faces the river.

Figure 32. The exterior view of the Xiuning Shuanglong Primary School from the other side of the river (Photographs by author)

The design of the Xiuning Shuanglong Primary School is based on sustainable concepts and deep research into local environment. “Recyclable building materials were used to reduce energy consumption and mitigate environmental pollution. Exterior walls were built in a sequence of the thermal insulating rock wool sandwich board, light steel structure, surface and waterproof polycarbonate multilayer board from the inside to outside. Between the thermal insulation layer and surface, an air interlayer extending

from the south facade to roof was formed for air draft in summer and thermal insulation in winter by opening/closing the air vents. Polycarbonate multilayer boards were used for natural lighting of the buildings and all classrooms are provided with homogeneous diffused light to avoid shadow when the light irradiates the classrooms. In addition, effective design means were used to reduce energy consumption of the buildings and create comfortable indoor environment" (World Architecture, 2013).

Figure 33. The exterior view of the Xiuning Shuanglong Primary School (Photographs by author)

2) Process Inception

Compared with the other two projects, the initiation of Xiuning Primary School is relatively clear. The Xiuning Shuanglong Primary School was initiated, donated and implemented by WSP Architects as a private architectural practice charitable project.

Like the Bridge School project, the purpose of Xiuning Shuanglong Primary School project is to build a charitable hope primary school in the poor village of China. Compared three to four different sites, the school was rebuilt in its original site to keep the school in the village under the Movement of School Closure and Merger (Interview with Wu, 2018). It is the first such school in the village, and the local government and the school welcome the rebuilt as it was fully funded by the WSP Architects itself, indicated by the representative of Xiuning Shuanglong Primary School in an interview (2018). The same with Xiashan Primary School, Xiuning Shuanglong Primary School is a one donor sponsored project as well. But the difference is that Xiuning Shuanglong Primary School was designed and fully funded by WSP Architects with more than 1.5 million RMB (Interview with Wu, 2018). While the school building assets haven been fixed at 2 million RMB in 2018 (Interview with the representative of Xiuning Shuanglong Primary School, 2018).

3) Process Realization

WSP Architects organised relevant government departments and social resources to form a strong charity consortium at the beginning of the project, while simultaneously integrating a group of well-known companies, universities, and experts to participate in the design, from planning, site selection, design, construction, monitoring, and follow-up testing full depth participation and control. Where the Xiuning County Government and the County Education Bureau in Anhui Province have given strong support in site

selection, local planning application approval, and reconstruction of old houses. The Anhui University Education Foundation conducted full financial management. Huaxin Post and Telecommunications Consulting and Design Institute, as the assisting design unit of the project, is mainly responsible for the design of the structural part; the site strategy is completed by Professor Zhu Xiaocun and his team from the School of Architecture and Urban Planning of Tongji University; the structural strategy consultant is served by Professor Zhu Jingxiang, the Chinese University of Hong Kong, Professor Wang Xiaoping from Wuhan University of Technology (Wu, 2015).

Before the project started, WSP Architects did a case study to understand the local situation. But "If I do it again, I think it should be like Europe, for example, to make the time period longer. At that time, we spent almost 2 to 3 years to choose the site, more than a year to design, and then spent a few months to build, so the whole process took for nearly 4 to 5 years. However, I think it should take at least 7 to 8 years in China, in which you must spend at least half of the time doing the communication with the villagers. What are the most needs of the villagers? What are they more eager for? And how to slowly guide them to participate in the process", the architect Wu mentioned in an interview (2018).

During the process of the project, there have been different opinions between the local government and the design team. Where the Anhui Education Foundation acted a coordinated unit to help coordinate with the government (Interview with Wu, 2018).

But the locals were supportive as there was someone to pay for the bill, which WSP Architects fully funded the design and construction. (Interview with the representative of Xiuning Shuanglong Primary School, 2018).

Professor Zhu Jingxiang from the Chinese University of Hong Kong, Li Jiangnan, classmate of chief architect Wu Gang, the Anhui Education Foundation had been invited to visit and select the site. Other architectural professions went to the site to visit, and finally set up such a school. The chief architect had also implemented a case study with a group of statistical students. They did a lot of research, including on-site inspection and functional research. (Interview with Wu, 2018). The design work has cooperated with the Huaxin Design Institute in Hangzhou. Basically, the role of WSP Architects is investing, designing, and assisting the party B to choose the construction partner (Interview with Wu, 2018).

4) Post Construction

The Xiuning Shuanglong Primary School used to face the force of school closure. There is a primary school in the town, which takes only five or six minutes to drive to the town primary school. Many parents chose to send their children to the town to study. While the classroom situation also let the school itself difficult to maintain. After the school was completed in 2012, the school was saved. It was expanded from the original three classes to seven classes, from preschool to sixth years. The number of students has

gradually increased. There are even more students than the central elementary school. The new classrooms on the left are steel structure, and the original classrooms on the right are brick and wood structure. The new classrooms are significantly different from the local architecture, but the school is hidden in the middle of the alley, which is not obvious.

Figure 34. The new light steel structure of the Xiuning Shuanglong Primary School (Photographs by author)

Figure 35. The old concrete buildings in the other side of the Xiuning Shuanglong Primary School (Photographs by author)

The maintenance of Xiuning Pavilion costed about 10,0000 RMB but did not achieve the expected results. The children usually have activities in the activity room next to the classrooms. The utilization rate of this Xiuning Pavilion is low (Interview with representative of Xiuning Shuanglong Primary School, 2018). Xiuning Pavilion is a construction experiment and has no special meaning. This pavilion uses the principle of leverage and uses the Rainbow Bridge in the Qingming River map as precedent. “Maybe able to inspire a child to be an architect?” proved by chief designer Wu in an interview (2018).

Figure 36. The activity room of the Xiuning Shuanglong Primary School with open light steel structures (Photographs by author)

Figure 37. The Xiuning Pavilion acts as a symbol, a sculpture (Photographs by author)

Wu Gang, the architect, has put forward a three-win public welfare concept of "education, architecture and society". "From an educational point of view, we should emphasize local education, not to build a new building in a town, but to change the built environment and space environment where education is needed. Otherwise within these children, there are a group of children who are educated, but another group of children may lose their education. From a social point to say, when these children come back to this mountainous area, there are more people in the village, the economy then has a certain vitality, and the society has also developed. There is still a lot to be improved. We may need more work on the research and communication with the local villagers. This is a very slow process" explained by Wu in an interview (2018).

The architect Wu emphasized in an interview (2018) that "We consider that the children sit here and learn, don't be distracted, so the windows are designed to come in diffuse light, without direct light. We hope that the whole construction process is low-carbon and environmentally friendly and meets a good building standard. Therefore, the prefabricated light steel structure is adopted, and some environmentally friendly materials are used. The façade of the classroom has two layers of skin so that it can be ventilated in the summer and warm in the winter. We have fewer aesthetic considerations. We think more about the physical properties and the quickness of construction. How can it be faster, and the implementation does not affect the children's reading?" However, there were some major problems in the school usage.

Figure 38. Diffuse light comes into classrooms of the Xiuning Shuanglong Primary School

(Photographs by author)

Until field work in September 2018, there were 50 students and 4 teachers in the Xiuning Shuanglong Primary School, and students on this campus were from the first year to the third year. Because of the classroom height problems caused by the increasingly structural subsidence, senior children needed to move to another campus to have higher classrooms that could meet their daily use requirements. The temperature is too high in the summer due to non-insulation inside the room resulted by the new metal material. Then during the visit, it was found that incandescent lamps were needed in the classroom during the day, otherwise the light would be insufficient to meet the learning needs. This resulted by the high window opening position for diffused light. Finally, the structural subsidence need maintenance, but the maintenance cost was high.

All subsequent follow-up maintenances are carried out by WSP Architects. During the visit, the representative of school (2018) said that WSP Architects had already done maintenance cost assessment, about 20,0000 RMB.

Figure 39. The classroom height problems caused by the increasingly structural subsidence; Wooden pillars are temporarily used for support (Photographs by author)

Figure 40. The fans are needed to adjust the room temperature during summer classes. During the day, students need to use lamps to ensure their learning needs. The Xiuning Shuanglong Primary School (Photographs by author)

After the Xiuning Shuanglong Primary School was completed, WSP Architects have had several post-visits and donated books, table tennis tables and other supplies (Interview with Wu, 2018).

In terms of daylighting and temperature insulation, there are some problems in the new classroom. However, the representative of school (2018) also pointed out that the leakage of rain in the old classroom is a big problem as well.

Figure 41. The leakage of rain on the wall in the old classrooms of the Xiuning Shuanglong Primary School (Photographs by author)

The following table summarized the comparisons of three cases:

Categories	Bridge School	Xiashan Primary School	Xiuning Shuanglong Primary School
The reason to do the project	• One of Li Xiaodong's friend from Singapore would like to donate a hope primary school in China • Project manager Chen Jiansheng is a local people from Fujian • Use earthen building as a background could be more meaningful	• Architect Qin Luofeng has done the whole area's planning • Consigned by the government to do the project with lower design fees	• The architect wants to do something charitable things • To solve local education difficulties
Fees	• It's not a CYDF project at the beginning • Due to funding reason, the architect contacted CYDF • The whole construction fees half from Li Xiaodong's friend through CYDF, half from local government	• Funding came from land sale • Funding limitation results to design limitation • The design fees are lower than the architect's normal business fees as a charitable project	• Fees all paid by WSP architects
Communicate with local community	• Project manager Chen Jiansheng and local government carried this together	• The work to communicate with local community and local people was carried by government • No conversation between architects and local community	• A social survey has been conducted by architect Wu Gang and a group of students to understand local issues

			• The model of "society, education, architecture"
Phases	• One phase project	• Two phases project	• One phase project
Post-maintenance	• The architect did the post-maintenance in the first few years, then later they are challenged how to push the local government and community to realize their responsibilities to raise their awareness to protect the building and environment	• Nearly no post-maintenance	• The architect did the post-maintenance continuously and paid the post-maintenance fees
Current usage	• The school is currently not used as a school • The initial idea of the project was to design a hope primary school, but it cannot be achieved. Finally, it was not designed as a typical primary school • The project was not designed to solve any educational problems, as the local community they didn't need so	• Currently 6 years with 22 classes • Has been used as a school for over 3 years • There are many design flaws, however, it's still satisfied by the teachers, students and parents, as to be compared with the old school, all the things have been much better, and they enjoyed the school life	• Due to the building height, the school is still in use, however, only 1-3 years are studying in the campus currently, the other three years students are in the other campus. • There are many design flaws, which have affected the students' normal study. • The school is facing to be closed again.

Table 26. The comparisons of three cases (by Author

Chapter 5: Results, Synthesis and Discussion

Introduction

The previous chapter has described how the on-site case study has been carried out for the three selected projects, as well as how the data collected from the field work has been processed and analysed. This chapter will then build upon analysing and discussing the research results by answering each of the four key research questions and sub research questions.

5.1 Research Results Discussion by Answering Research Questions

5.1.1 Answers for the Key Research Questions:

Firstly, the results for the four key research questions will be discussed using the data collected in the research. As discussed in chapter 1 & 3, the four key research questions are:

RQ1. What is humanitarian architecture and why is it growing in importance as a means of providing for disadvantaged communities in China?

RQ2. How does humanitarian architecture meet community needs in relation to the provision of schools?

RQ3. What are the barriers and drivers to humanitarian architecture in China and how do these affect the process?

RQ4. How can the process of humanitarian architecture be improved to ensure contextually relevant and successful outcomes in China?

The research results will be discussed by answering these research questions.

1. What is humanitarian architecture and why is it growing in importance as a means of providing for disadvantaged communities in China?

As mentioned in the literature review section, humanitarian architecture provides solutions in response to natural- and man-made societal or environmental problems and its scope can be broadly classified into two categories: 'post-disaster' projects; and 'socio-economic community development' projects. These are often referred to under many guises, such as "public interest design", "community design", "design for the broader good", "pro-bono design", "socially conscious, socially just, and socially aware design", as well as "asset-and needs-based design" (Wilmes, 2015). In the past few decades there has been increasing global concern for people in developing countries who are suffering from disasters, diseases, poverty, etc. As a result, many charitable organizations, architects, universities, and others have become involved in humanitarian projects to help alleviate some of these social problems by utilizing architectural design skills. Significantly, in recent years there have been also increasing concerns about the roles and responsibilities of architects and the appropriateness of humanitarian architecture.

Humanitarian architecture has been undertaken in China, however, for cultural reasons this has not been under the 'humanitarian' banner. Indeed, the term 'humanitarian architecture' is not recognized by the Chinese architectural community and similar descriptions tend to refer to "architects involved in the humanitarian field" or "an architect with a humanitarian spirit". As such, humanitarian architecture within China is typically known as "charitable public welfare architecture" and "humanitarian" efforts are considered to belong to less developed countries. In the last ten years, due to the fragile rural environment in China and frequent natural disasters, there have been many 'humanitarians' projects developed to respond to the need for 'post-disaster reconstruction' (Zeng and Huang, 2015). As a result, and similar to the global picture, research into post-disaster humanitarian architecture has increased significantly, however, research into 'non-disaster relief' projects focused on socio-economic development is rare. The rapidly developing economy in China has resulted in the gap between rich and poor becoming wider particularly in relation to the standard of education and school facilities between urban and rural areas (Fan and Tanoue, 2015). This situation has particularly affected migrant workers, who are the products of the unique urban-rural system in China. This has resulted in a special social group emerging whereby many migrant workers move to cities for employment opportunities leaving their rural 'left-behind children' in their hometowns or villages.

Due to the historical accumulation of long-term passive export roles in rural areas in the process of urbanization, the uneven allocation of urban and rural resources, the

lack of educational funds and teaching resources, poor conditions for running schools in rural areas, and a sharp decline of amount of rural school-age children resulted from the large number of rural young laborers flocking to cities to find job opportunities with taking their children away, government policies to withdraw and merge rural schools, and other reasons, the rural primary schools that in slow development and lack of construction have been the main targets of donations by many charitable organizations (Yu, 2017).

In terms of project initiation, the delivery process of 'humanitarian' schools in China, can be grouped into five categories: government-initiated projects; NGO-initiated projects; private architectural practice-initiated projects; higher education institution-initiated projects; and company-initiated projects.

According to an interview with Wu (2018), when mentioned "humanitarianism" in China, which is something political, its more appropriate to describe "humanitarian architecture' as "charitable' or "public welfare" architectural projects.

"In China, there are nearly 40% of people don't know where their living expenses will come from next year. I think "humanitarian" is a relative word, "disadvantaged communities" could also be some old communities in the city or "village in the city", we need to provide more to those who indeed need better spaces. Even in Beijing, between the Fourth Ring and the Fifth Ring, there are a considerable number of

extremely poor people, with a family income of less than 10,000 yuan a year. How to serve these people utilizing architectural skills, what kind of life services could be provided for them, including simple spaces for communication, there are many possibilities to investigate as an architect. To participate in charity projects, does not mean that you must pay money or something, but using your own ability to help people who really need help." (Interview with Wu, 2018)

"Most public welfare construction projects are conducted by social units with funds donated by certain enterprises or individuals. However, in recent years, some design practices and universities have jointly proposed the model of "revitalizing the countryside", has become a new form of public welfare construction" (Interview with Zhou, 2018).

"The best way for an architect to help society is using his professionalism to solve social problems. The importance of a project is not determined by its political ethics, otherwise it will become a moral kidnapping. The decision of participating a project or not should not be affected by whether it is a charitable project but using my professional skills to give the buildings humanitarian spirts. There are also many hypocritical things in charity. For example, many rich people are very harsh on his employees in other aspects, and then he uses the money he earns to buy a reputation. Should you serve this kind of person? Right, so for me, I can't do it just because it is a charity project. The question is how to define the "public interest" and

"humanitarian"? Is it public interest and humanitarian after I finished it, or it must be before doing it?" (Interview with Zhu, 2018)

Sometimes when the project was first started, it was not aimed as doing for public welfare, but later it has a public welfare impact. As emphasised by Qin in an interview (2018), perhaps from the point of view of Party A, they did not think it is public welfare project, it was simply a task.

Key findings:

- Humanitarian architecture provides solutions in response to natural- and man-made societal or environmental problems and its scope can be broadly classified into two categories: 'post-disaster' projects; and 'socio-economic community development' projects. These are often referred to under many guises, such as "public interest design", "community design", "design for the broader good", "pro-bono design", "socially conscious, socially just, and socially aware design", as well as "asset-and needs-based design" (Wilmes, 2015).
- The rapidly developing economy in China has resulted in the gap between rich and poor becoming wider.
- Like the world-wide humanitarian architecture study, research on post-disaster humanitarian architecture has expanded significantly, however,

studies focused on socioeconomic development in 'non-disaster relief' programmes are uncommon.

- Humanitarian architecture has been undertaken in China, however, for cultural reasons this has not been under the 'humanitarian' banner. Indeed, the term 'humanitarian architecture' is not recognized by the Chinese architectural community and similar descriptions tend to refer to "architects involved in the humanitarian field" or "an architect with a humanitarian spirit".

2. How does humanitarian architecture meet community needs in relation to the provision of schools?

To meet community needs sufficiently, case studies and cooperation with local government, local communities are adopted in the selected cases. The initial project outline of the Bridge School was framed together with the school representative, head of local village and the architect. As a local, project manager Chen knows the local cultural well, he also emphasised in an interview (2018) that: "I think the biggest barrier to do such a humanitarian project in China is the communication with locals. As they are party A, they are the owners. You must have enough confidence and time to communicate with them to let them understand and support you. This is the key point of the whole project. Because if they do not understand you at first, they will not cooperate with you. If they have not understood, supported, or realized how the project would be in the future, it is difficult to build up a favourable long-term operation." He also reflected on how "We all took it for granted, so encountered

several problems that were not easy to solve. For example, we did not reach an agreement with the villagers on the surrounding old houses at the beginning, and then had to work in a difficult environment. Finally, the local government helped us to slowly coordinate, and removed the surrounding old and some unused houses. Then we were able to create the space".

As a government-initiated project, the communication with local villagers of the Xiashan Primary School project were undertaken directly by the government. For example, the site location of the project is a result of communications and discussion with the local villagers.

Before the Xiuning Shuanglong Primary School project started, WSP Architects did a case study to understand the local situation. But "If I do it again, I think it should be like Europe, for example, to make the time period longer. At that time, we spent almost 2 to 3 years to choose the site, more than a year to design, and then spent a few months to build, so the whole process took for nearly 4 to 5 years. However, I think it should take at least 7 to 8 years in China, in which you must spend at least half of the time doing the communication with the villagers. What are the most needs of the villagers? What are they more eager for? And how to slowly guide them to participate in the process", the architect Wu mentioned in an interview (2018).

Key findings:

- Case studies and partnership with local government are used to satisfy community needs.

3. What are the barriers and drivers to humanitarian architecture in China and how do these affect the process?

"In China, philanthropy is developing at an unimaginable very rapid speed and scale, and there is huge room for development. With the continuous development of society, charity will become more and more important and become routine. The amount of donations has increased exponentially every year. But how to make good use of this money, how to establish an evaluation system and standards, and how to establish a complete public welfare system is a huge task that our society needs to solve" (Interview with Wu, 2018).

"China's non-profit organizations are divided into two categories. One type of non-profit organization is donating money, such as the Bill Gates Foundation. While the other is implementing these public welfare projects. In addition, there are some enthusiastic individuals that some are willing to pay, and some are willing to do something. However, for the entire system, I think the most important problem is the lack of a unified standard. First, how to get these funding? Then how to evaluate the project and spend the money? Finally, was it worth the spent? What is its entire evaluation system? In fact, currently no one is in charge of these, and it is difficult to

establish standards. China's public welfare is just beginning and in a very early stage of development." (Interview with Wu, 2018)

"The biggest obstacle to the implementation of public welfare construction is the source of funds and whether it can really bring some changes to the local area, rather than doing it as a publicity stunt. I personally think that public welfare is better to be pure, through social influence to encourage more people to participate, and be more open and transparent. In the past few years, some charities and the Red Cross frequently broke out scandals, leaving many people still prejudiced against public welfare projects. My suggestion is to promote some positive content and reports, to create influence with actual project operation, which means to make the project more open and transparent. Cooperation with universities is a good way, such as setting up construction "work camps" to continue the traditional construction technology, update the concept of public welfare construction, and better promote it" (Interview with Zhou, 2018).

"The voice of disadvantaged groups is very important. At present, there are relatively few projects in the society that really pay attention to this kind of social issues. I think that the mainstream of Chinese social development should have been more open and pay more attention to disadvantaged groups, but now it is an economically driven society, and the gap between the rich and the poor in society is growing. Currently, there is no such a mechanism and platform in China. For example, take

public welfare projects out and ask publicly if any architects are willing to do it" (Interview with Qin, 2018). If an architect devotes himself to this kind of public welfare, it is difficult to maintain his normal life needs. "It is not enough to support family expenses if only doing public welfare projects." In addition, "non-disclosure and non-transparency is the biggest problem of China's public welfare projects. The Red Cross has repeatedly raised questions about where people questioned where the money went after donating money. I think China's public welfare system should clearly state what can and cannot be disclosed. If it can't be made public, the reasons must be claimed" (Interview with Qin, 2018). Qin also mentioned why currently in China, students rarely participate in such public welfare projects. "First of all, our actual project process is relatively short and urgent, it is difficult to match the academic timetable. In addition, the actual participation ability of our students is relatively weak" (Interview with Chen, 2018).

In terms of project realization, project manager Chen (2018) emphasised in an interview that: "I think the biggest barrier to do such a humanitarian project in China is the communication with locals. As they are party A, they are the owners. You must have enough confidence and time to communicate with them to let them understand and support you. This is the key point of the whole project. Because if they do not understand you at first, they will not cooperate with you. If they have not understood, supported, or realized how the project would be in the future, it is difficult to build up a favourable long-term operation."

Key findings:

- Philanthropy is growing at an unprecedented rate and scale in China, and there is still much room for growth. With the advancement of society, charity will become increasingly important and routine. The number of donations grows exponentially each year. However, determining how to best use this money, establishing an evaluation system and standards, and establishing a comprehensive public welfare system is a massive task to complete.
- One of the most essential barriers to humanitarian architecture in China is the lack of a unified standard.
- Another key barrier to do humanitarian project in China is the communication with locals.

4. How can the process of humanitarian architecture be improved to ensure contextually relevant and successful outcomes in China?

There are some important lessons that can be learned from these three projects in relation to future 'humanitarian-type' projects. It is important that there is close engagement, collaboration and clear communication with the local community and local government from the outset of any humanitarian architecture project. It is also essential that the funding mechanisms are fully understood, and costs are planned accordingly including consideration of the need for future repairs and management. Any policy requirements in relation to the intended end-use must also be identified and complied with to ensure the long-term success of the project. The design should

not only focus on the beauty of the building, but a careful understanding of the needs of the end-users.

1) *The importance of close engagement, collaboration and clear communication with the local community and local government:* It is important to have a close engagement, collaboration and clear communication with the local community and local government. This ensures a clearer understanding of each other so that the project goes smoothly. Compared with the other two cases, the initial progress of Bridge School project was bumpy in a result of lacking adequate communication with the local villagers and local government. Things were changed when the local community began to understand the intentions of the project. As a demolition and resettlement project, the Xiashan Primary School project had the close cooperation of the local government. The design team was trusted by the local government, the approval process of the project was relatively smooth, where the communication with local villagers were carried out by the local government committee. In terms of Huangshan Xiuning Shuanglong Primary School, WSP Architects did a case study to understand the local situation before the project started. During the process of the project, the Anhui Education Foundation acted a coordinated unit to help communicate with the government.

2) *The importance of clear funding mechanisms:* It is also essential that the funding mechanisms are fully understood, and costs are planned accordingly including consideration of the need for future repairs and management. The Bridge School

project was initially to be fully funded by a personal donor from Singapore, but due to financial difficulties, only 50% of fund could be provided, which means they had to find another sponsor to fund the other 50%, otherwise the project had to be discarded. In an interview with Chen (2018), he emphasized that he therefore found the head of Pinghe County, told the matter thoroughly, including the problems encountered, and the positive impact that might have in the future, which made the government agreed to fund, in just a verbal agreement. In fact, many things were spoken verbally and there was no formal documentary exchange at that time. The local government could make available funds for half the money that was needed for the entire building. The architect and initial personal donor need to make up the rest. The Bridge School project was later implemented as a charitable project by the CYDF, with the initial private donor providing 50% of the funds through the CYDF and the local government funding the balance. However, the government did not give out all the money at once. Instead, as the government officials cannot see the benefits from the project very soon.they took out a small part of fund each time, such as 10,000 RMB or 20,000 RMB when the project faced difficulties in funding, always in a hurry. The money was taken from the town government, in which the county government issued a document to let the town government pay the money first each time. “It was such a painful experience to get the funds” (Interview with Chen, 2018). The initial costs of the post-construction maintenance and management of the Bridge School came from the funding received for the Aka Khan Award for Architecture prize. This funding, however, only lasted for the first three to four years after the

project's completion in 2008. Subsequently, maintenance has been neglected with the local government reluctant to fund repairs and the local villagers unable to do so. Although Huangshan Xiuning Shuanglong Primary School is a fully charitable project as well, its funding mechanism is much clearer than the Bridge School. The Xiuning Shuanglong Primary School was initiated, fully funded, and implemented by WSP Architects as a private architectural practice charitable project. All subsequent follow-up maintenances are carried out by WSP Architects. Different with the other two projects, the funds are from donors, funding for the Xiashan Primary School project was covered by government. As a government 'demolition and resettlement project', the Xiashan Primary School was fully government funded, using the proceeds from land sales. However, it took longer time for the project to be completed, as the money was obtained step-by-step through the sale of land with each stage only commencing when funds were received.

3) *The importance of clear understanding of contextual policies:* Any policy requirements in relation to the intended end-use must also be identified and complied with to ensure the long-term success of the project. The most significant case for within the three cases is the closure of Bridge School. During the design phase, the government required that the village retained two classes within the school and as such, two classrooms were provided in the completed project. However, after a free in-depth investigation and evaluation of the project, by a local cooperative design institute in Xiamen, it was considered that the layout of

the Bridge School was insufficient to meet the requirements of a primary school and did not meet the China's specifications for primary schools. After the completion of the Bridge School project in August 2009, it did open as a school for a short time, however, in 2010 the two classes in the village moved out of the village and joined a nearby primary school. This move to the Central Primary School of Qiling Town was conducted under the legislation for the 'Movement of School Closures and Mergers'. Thus, the local children only studied in the Bridge School for a short period of time and symbolically the Bridge School then became a public reading room (Interview with Chen, 2018). Also related to the 'Movement of School Closures and Mergers', The Huangshan Xiuning Shuanglong Primary School has achieved a successful long-term use as a proper school. The purpose of this project is rebuilt the school in its original site to keep the school in the village under the 'Movement of School Closure and Merger'. After the school was completed in 2012, the school was saved. It was expanded from the original three classes to seven classes, from preschool to sixth years. The number of students has gradually increased. There are even more students than the central elementary school. While the Xiashan Primary School is a government-initiated project, which has a smooth process and relatively satisfied postage use.

4) *The importance of careful understanding of the needs of the end-users:* The design should not only focus on the beauty of the building, but a careful understanding of the needs of the end-users. There are lessons draw from all these

three cases on the real needs of the end-users. Although the Bridge School is no longer used as a school, it has become a significant structure within the village and a much-needed leisure space for the villagers, in which achieved its original function as a bridge. However, in terms of the Huangshan Xiuning Shuanglong Primary School and the Xiashan Primary School, both have problems in its post-use. The Xiashan Primary School is beautiful and elegant in its modelling, from its gardening plan, huge opening windows to its clean white colour. But problems also have come out from these beauty aspects. Firstly, there are large special-shaped windows, but the locations of some of them are very high which causes rain and snow to enter the corridor and when the rain is heavy in the summer, water will accumulate. For example, heavy rain in the Summer of 2017, caused the entire dace classroom floor on the ground floor to be flooded. Also, in the winter, the snow will freeze, and it becomes slippery, which is dangerous for teachers and children. The corridor connected to the second-phase teaching building on the second floor always freezes in the winter, which results in laying temporary mats or closing that corridor to avoid any dangerous situation. Secondly, as the teaching buildings are designed with a flat roof, the walls need to be plastered every year because of rainwater leaking into the building. In addition, the natural light in the classroom is insufficient to meet the daily learning requirements of the students, thus the lights need to be turned on during the daytime, which has increased the overall energy consumption. Moreover, during the fieldwork it was noted that there are sound problems due to the hard surfaces of the interior design. Even during class, the reading sounds of children

in the classroom will reverberate throughout the building, and the noise will be even greater after class. As for the Xiuning Shuanglong Primary School, the new classrooms with steel structure are significant from the local architectural context. The architect Wu emphasized in an interview (2018) that “We consider that the children sit here and learn, don't be distracted, so the windows are designed to come in diffuse light, without direct light. We hope that the whole construction process is low-carbon and environmentally friendly and meets a good building standard. Therefore, the prefabricated light steel structure is adopted, and some environmentally friendly materials are used. The façade of the classroom has two layers of skin so that it can be ventilated in the summer and warm in the winter. We have fewer aesthetic considerations. We think more about the physical properties and the quickness of construction. How can it be faster, and the implementation does not affect the children's reading?” However, there were some major problems in the school usage. Until field work in September 2018, there were 50 students and 4 teachers in the Xiuning Shuanglong Primary School, and students on this campus were from the first year to the third year. Because of the classroom height problems caused by the increasingly structural subsidence, senior children needed to move to another campus to have higher classrooms that could meet their daily use requirements. The temperature is too high in the summer due to non-insulation inside the room resulted by the new metal material. Then during the visit, it was found that incandescent lamps were needed in the classroom during the day, otherwise the light would be insufficient to meet the learning needs. This resulted by the high window opening position for diffused

light. Finally, the structural subsidence need maintenance, but the maintenance cost was high.

Key findings:

- It is important that there is close engagement, collaboration and clear communication with the local community and local government from the outset of any humanitarian architecture project.
- It is also essential that the funding mechanisms are fully understood, and costs are planned accordingly including consideration of the need for future repairs and management.
- Any policy requirements in relation to the intended end-use must also be identified and complied with to ensure the long-term success of the project. The design should not only focus on the beauty of the building, but a careful understanding of the needs of the end-users.

5.1.2 Answers for sub-research questions:

As mentioned in the previous chapter, this study identified 11 sub-research questions, although some sub-research questions were changed or merged into other sub-research questions during the research process. Following are original 11 sub-research questions:

SRQ1. What are the responsibilities of architects involved in the humanitarian architecture in the provision of schools in China, how do these happen and how do these affect the process of the projects?

SRQ2. How do universities/private architectural practices/NGOs participate in humanitarian architecture in relation to schools in China?

SRQ3. How do different delivery mechanisms affect the success of humanitarian architecture in relation to the provision of schools in China and how can these be improved?

SRQ4. Why is the long-term operation of humanitarian school constructions in China needed and how to guarantee that?

SRQ5. What are the most basic needs of the disadvantaged communities in China, and how can these basic needs related to education can be satisfied using architectural solutions?

SRQ6. How could architects balance between the local basic needs and architectural design innovation?

SRQ7. How could designers balance between public voice and personal economic needs when engaged in humanitarian architecture in the provision of schools in China?

SRQ8. Why should humanitarian architecture in the provision of schools should be standard (construction, stability, standard, prefabrication) and how could prefabricated humanitarian architecture meet the local circumstances in relation to the provision of schools in China?

SRQ9. How successful is the current process of humanitarian architecture in China and what are the unsuccessful aspects and how to improve?

SRQ10. Why should sustainable design solutions be provided to the disadvantaged communities of China?

SRQ11. Is there any university-affiliated design/build studio or community design centre in China? If not, how could this be introduced to China?

The research results will be analysed in detail by answering each of the sub-research questions:

1. **What are the responsibilities of architects involved in the humanitarian architecture in the provision of schools in China, how do these happen and how do these affect the process of the projects?**

In the context of globalization and urbanization, architects not only provide professional services of architectural design, but also constantly adjust their professional identity and reflect on professional social responsibilities in practice (Yu, 2017).

The responsibilities of architects involved in the humanitarian architecture can be discussed from two categories, the legal responsibilities of architects and social responsibilities.

In terms of the legal responsibilities in professional area, according to the Chinese basic construction procedures, the main job of the architects is just design, and they only cooperate during the construction phase (Guan & Wang, 2015). For a long time, architects in the mainland China have basically only participated in the preliminary work of the construction, such as the overall conception and design drawings (He, 2015). However, compared with other conventional construction projects in China, the three selected humanitarian construction projects are different in the content of the responsibility of the architect.

In these three projects, the architects are responsible from the beginning of the project to the end of the project construction, and even the later maintenance stage. In the Xiuning Shuanglong Primary School project, the design work has cooperated with the Huaxin Design Institute in Hangzhou. Basically, the role of WSP Architects is investing, designing, and assisting the party B to choose the construction partner (Interview with Wu, 2018). Professor Zhu Jingxiang from the Chinese University of Hong Kong, Li Jiangnan, classmate of chief architect Wu Gang, the Anhui Education Foundation had been invited to visit and select the site. Other architectural professions went to the site to visit, and finally set up such a school. The chief architect had also implemented a case study with a group of statistical students. They did a lot of research, including on-site inspection and functional research. (Interview with Wu, 2018). And all subsequent follow-up maintenances are carried out by WSP Architects. Similarly, STI Studio participated in the Xiashan Primary School project from the beginning to the end, from design drawings to construction drawings, until

the project completion. Professor Qin explained in an interview (2018) that STI Studio is responsible for both the drawings and the supervision of the construction phase of the project. In China, construction is not usually supervised by the architects, but in this project, all the construction problems were solved by the architects. The engineers also went to the construction site regularly, helped to monitor and solve the problems until the construction was completed, which is typically outside of the architect's responsibilities in China. The registration of STI Studio is under The Architectural Design and Research Institute of Zhejiang University, and the design of the structure, water and electricity of the Xiashan Primary School project were all coordinated by its engineers. As the Xiashan Primary School is a relatively new project, the final phase of this project has just been completed in September 2018, so there has been little need for post-construction maintenance and management apart from dealing with the issues of rain and snow mentioned above. However, after the completion and acceptance of the project, there was not much to do with the design institute. In terms of the Bridge School project, the design team participated in the project from project inception, designing, construction to the post maintenance phase. In vernacular construction in rural China, the change of the architect's identity from an intervener to a participant makes the construction project return to the site and rural life. The content of the job of architects has gone far beyond the monotonous technical practitioners in urban construction, and their professional identity has also changed from a technical service provider to a multi-identity worker, that is organizer of rural construction activities, designer, and builder as well (Yu, 2017).

Moreover, the professional responsibilities of Chinese architects now have some changes. On October 29, 2015, the Shanghai Pudong New Area government announced that they will carry out a special reform of the construction industry and explore the Architect Responsibility System in the bonded area (Fang, 2017). The Architect Responsibility System takes the architect as the main body of responsibility and is entrusted by the construction unit. During the construction of the project, the whole process from the architectural design to the completion of the project, and sometimes even extends to the warranty period. Completely deliver the construction works and projects that meet the requirements of the construction unit." (Guan & Wang, 2015) The Architect Responsibility System extends the job of architect from the traditional single design work to the construction stage until the completion of the project. The scope, content and responsibilities of the Architect Responsibility System are far greater than the traditional Chinese conventional architectural design services (Guan & Wang, 2015). The Architect Responsibility System is still in the transitional period of reform, the actual process has not achieved full accountability, but the documents have been released and more and more designers are very responsible for many small projects now and are directly responsible for the later stage. Therefore, the responsibilities of architects involved in the humanitarian architecture in the provision of schools in China would be extended as well. "The implementation of the Architect Responsibility System can improve the professional and scientific level of architectural design, give play to the architect's subjective initiative, and strengthen the architect's sense of responsibility and professional identity" (Fang, 2017).

As for the social responsibilities of the architects, that is something related to but not limited to their professional field. Yu (2017) has summarized the commonalities presented by architects in the practice of rural construction in terms of values, working methods, and participation roles, and seeks footholds and feasible ways for architecture to intervene in rural construction at different levels.

Focused on solving real problems in rural communities, the rural construction activities of contemporary architects are not limited to exploring effective ways to resolve the contradictions between global and regional, modern and historical, and industrial and handicraft, but to transform the solutions to specific problems in the development of rural society. The core problem to be solved in vernacular construction is the relation to people, the villagers, and their vernacular society. Architects intervene in rural society through limited rural construction activities, provide suitable production and living space for rural communities, stimulate autonomy of villagers in participating in rural construction and village construction, and promote the sustainable development of local rural economy and culture (Yu, 2017).

The architects involved in social construction works in rural communities always present in multiple professional identities. In order to finally achieve the design goal, truly effectively and continuously serve the local rural society and villagers, the

architects “need to explore different vernaculars, specific social issues of the society, find its inherent operating logic, integrate and restructure multiple elements such as capital, industry, manpower, and technology, and take the rural community mechanism and local villagers into the design considerations, and consider how to manipulate the project and maintain the follow-up interaction between the project and the local area”(Yu, 2017).

To regenerate the local community, the architects fully understand the social structure of rural communities and integrates into local social organizations through building construction activities, which has stimulated the independent renewal vitality of the community and rebuilt local rural social organizations.

Traditional rural settlements have a continuous and complete construction system, which is based on close rural social neighbourhood relations and is an important part of the local rural social communities. Therefore, the construction activities in the rural environment are not only a technical process in the field of architecture, but also a cooperated process of various links in the rural society. In rural construction activities, the village must be treated as a whole object, the jobs of architects are not limited in building constructions. “Architects need to temporarily break away from the theories, paradigms, methods, and other professional content concerned in the field of architecture and set their sights on the operation logic of rural society beyond construction” (Yu, 2017).

The architects also pursue the authenticity of architectural design and adapt to local construction environment, which refers "creating an honest and suitable structure that conforms to the function and objective environment of the building and its social, cultural and historical background" (Yu, 2017). For example, they take the local construction status into consideration, and seeks the choice of building materials and structural systems to be able to adapt to the actual conditions. “Low cost”, “rapid construction needs” and “local construction inertia”, “the level of the construction team”, and “labour remuneration” are measured accordingly.

In addition, the architects not only completed the commissioned rural construction tasks, but also actively or passively tried to appropriately promote and operate these construction systems and construction models in certain areas to the interests of all parties in the society, seeking to expand the impact of the rural construction model and cross-border cooperation to a wider extent.

Fully understand the living habits and production needs of residents, apply low-cost suitable technologies, encourage villagers to participate in community construction, respond to the demands of villagers demands, and promote rural construction and development. The value of “architects serving the public” is exactly the social value of architecture and the professional social responsibility of architects.

2. How do different delivery mechanisms work in humanitarian architecture projects in relation to the provision of schools in China and how can these be improved?

This research question 2 is framed from original research question 2&3:

How do universities/private architectural practices/NGOs participate in humanitarian architecture in relation to schools in China?

How do different delivery mechanisms affect the success of humanitarian architecture in relation to the provision of schools in China and how can these be improved?

The research questions have been modified according to data collected from site visits and interviews with key people from the case studies. After carrying out the on-site case studies, it has been found that none of the cases in the three case studies are delivered by universities. The Xiashan Primary School was assumed to be a government-initiated with university participated project, however, there is no involvement of students and department in this project. The reason why this project is called the architectural project of Zhejiang University is because STI Studio is registered with the Architectural Design and Research Institute of Zhejiang University.

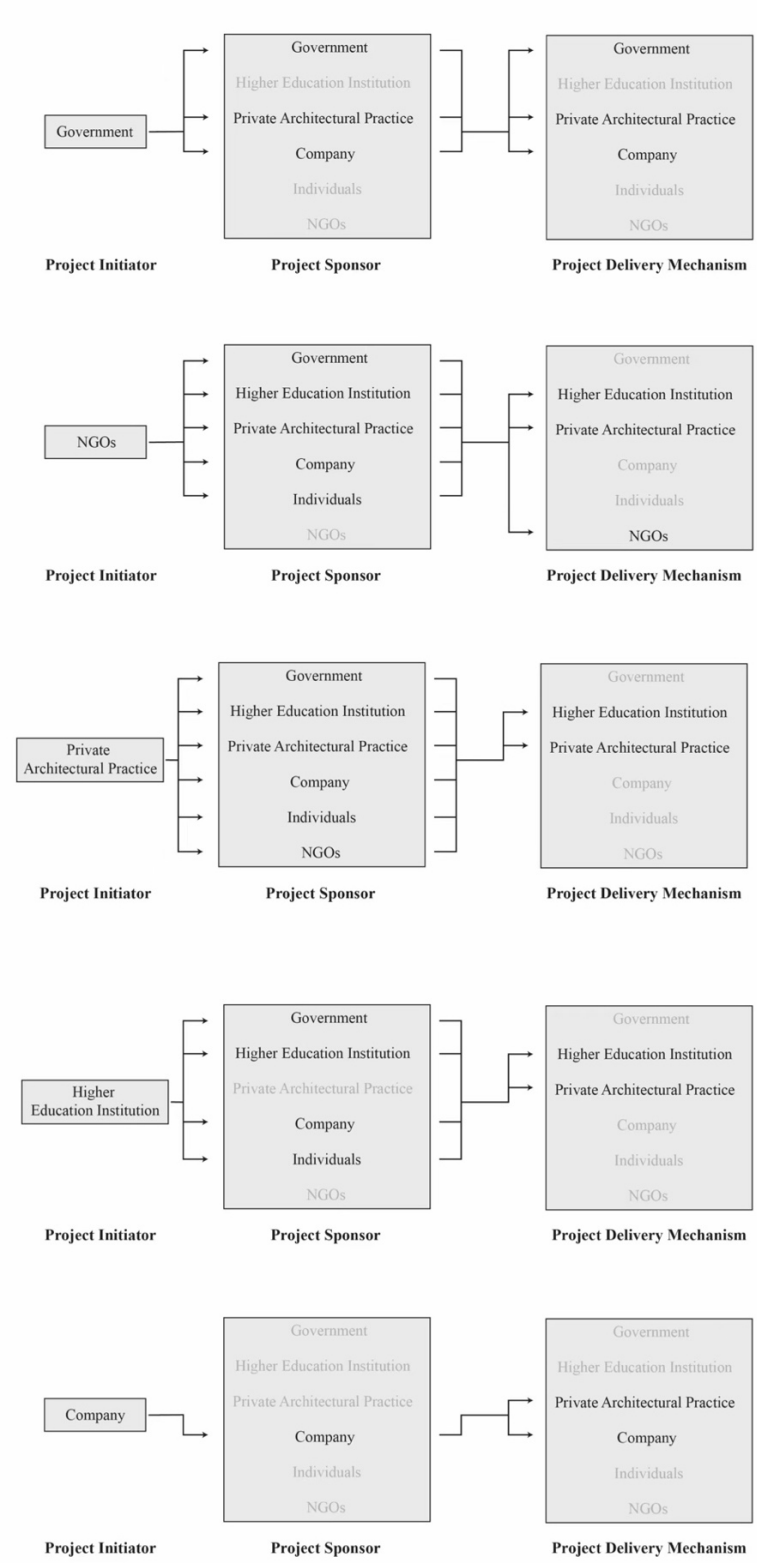

Table 27. Different delivery mechanisms of humanitarian architecture in relation to the provision of schools in China (by Author)

There are five typical different delivery mechanisms of humanitarian architecture projects in relation to the provision of schools in China: they are government-initiated projects, NGO-initiated projects, private architectural practice-initiated projects, university-initiated projects, and compony-initiated projects.

For government-initiated projects, the project sponsor could be the government, a private architectural practice, or a company, and the project would then be delivered by a private architectural practice with the cooperation of the government, or the government and the company if the company provided funding. For NGO-initiated projects, there could be individual sponsor or combined sponsors from government, higher education institution, private architectural practice, company, and individuals depending on the delivery procedure of each organisation. The projects would thereafter be delivered by the organisation with the support of a private architectural practice or, on occasion, a higher education institution. The sponsor for private architectural practice-initiated projects could be the private architectural practice itself or individual sponsor or combined sponsors from government, higher education institution, private architectural practice, company, NGO, and individuals. Often the private architectural practise delivers the project but in some cases, the higher education institution participates as well. For the university-initiated projects, although they are initiated by a higher education institution, they often have individual sponsor or combined sponsors from government, higher education institution itself, private architectural practice, company, NGO, and individuals and to be delivered by the higher education institution with cooperation of a private

architectural practice. However. compared the other two delivery routes of humanitarian school architecture in China, the route to deliver a company-initiated project is one way, which is always sponsored by the company itself and then delivered through a private architectural practice.

However, after investigation of the three selected cases, it was founded that these mechanisms sometimes overlap. For example. as a government demolition and resettlement project, the Xiashan Primary School is initiated, sponsored, and operated by the local government, but a private architectural practice was commissioned to complete the project. The Bridge School project was initiated and designed by a private architectural practice, but finally completed in cooperation with an NGO. Although the Xiuning Shuanglong Primary School was a fully private architectural practice-initiated project.

It is recommended that the way to participate in humanitarian construction in China is to choose a multi-directional approach, NGO-initiated route, private architectural practice-initiated route, or university-initiated route. Although the cases of university-initiated projects of humanitarian architecture in China are limited.

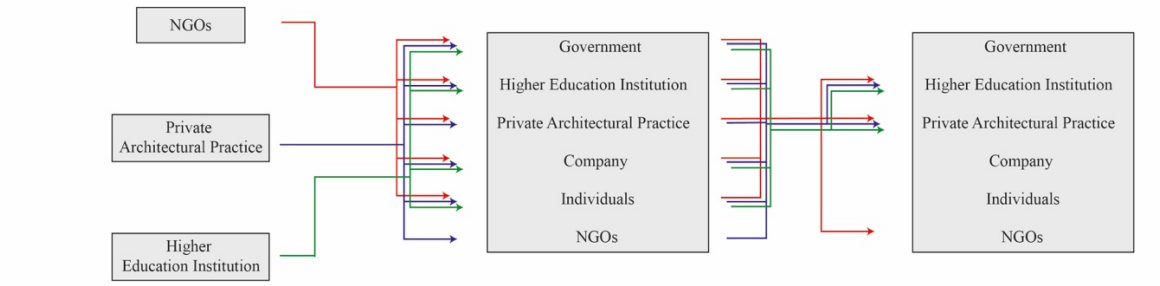

Table 28. Recommended delivery routes of humanitarian architecture in relation to the provision of schools in China (by Author)

Government-initiated Projects:

Chinese government has launched several poverty projects to address educational problems in rural China, such as New rural construction, Rural boarding school construction project, Rural primary and secondary school renovation project, Basic universal nine-year compulsory education and basic eradication of young and middle-aged illiteracy, Action plan for education for the 21st century.

The Xiashan Primary School is a government demolition and resettlement project. It is a public welfare project which is initiated, sponsored, and operated by the local government. As part of the overall regional planning, the government commissioned Professor Qin Luofeng from Zhejiang University to complete the project. Professor Qin has completed many projects in Anji, and his design team, STI Studio has undertaken many large regional planning with lots of village renovations across the

whole Ring Mountain area, including the overall planning of Xiashan Village (50 square kilometres).

As a government 'demolition and resettlement project', the Xiashan Primary School was fully government funded, using the proceeds from land sales and "the government directly handed over the project to us, and there were no others in the middle" according to Professor Qin in an interview (2018). The design fee for this project was 30% to 40% lower than typical projects (Interview with Qin, 2018). In fact, most of the design fee went to the engineers of the Architectural and Design Institute of Zhejiang University for their cooperation. It took more than two years to complete the Xiashan project, as the money was obtained step-by-step through the sale of land for development with each stage only commencing as funds were received.

As a demolition and resettlement project, the project had the cooperation of the local government. "We have done a lot of projects in Anji. Party A is very respectful to us. We had a good relationship with their committee at the time, we were very trusted in the process of approval. Basically, they approved our plan directly and did not need too much process. The approval process was relatively smooth" stated by Qin in an interview (2018). The government had little intervention in the project, only intervening to require minor adjustments, such as opening windows. At the beginning, STI studio submitted an initial plan to the government on how to design

the school. At that time, as the plot was not delineated yet, the government considered several different options, including whether to build the school on several small plots or a whole large plot. After the plot was finally determined, they decided on the planning and finally settled for one site for the school.

The context around the school was relatively messy as it neared the main road and was surrounded by the resettlement residential area. The villagers had opinions on this design as well. For example, they did not want the teaching building in the north, as it would be too far for them to collect their children. They also did not want the sports building to be near to the road, and they did not want the playground on outside because they thought it would be too noisy. However, these were not in line with the initial ideas and therefore, it was necessary to hold discussions with the local villagers. These were not undertaken directly by the STI studio and, instead as a government project, the government did this themselves. Thus, the site location is a result of communications and discussion with the local villagers and as a result, the architects revised the plan.

- **NGO-initiated Projects:**

Generally, public welfare projects in China need to get financial allocation from the government. Preliminary design, construction design and construction should run after approval for the feasibility study from the government departments (Deng and Wu, 2006). The NGOs participation in poverty alleviation in China is bound to

require government supports and must cooperate with local governments, however, most of the previous cooperation was on the lower level of cooperation and lacked overall planning, which led to the poverty alleviation resources of poverty-stricken areas have not been effectively integrated. There are several popular humanitarian projects initiated by NGOs in China, for example, Project Hope by China Youth Development Foundation (CYDF), Nesting Action Project by China Foundation for Poverty Alleviation (CFPA), Spring Bud Program, Spring Bud Plan, Spring Budding Boarding School by China Children and Teenagers 'Fund (CCTF).

Project Hope is one of the most well-known and widely participated philanthropic programs in China. It is a non-profit program launched by the China Youth Development Foundation (CYDF) in October 1989 to serve the social welfare undertakings for the development of young people in China. Its two major public welfare projects are the construction of Hope Primary Schools and the financing of poor students. Based on government's guideline of raising funds for education through multiple channels, Project Hope extensively mobilizes social resources to establish the capital and conditions for the transformation, establishment, and operation of rural primary schools, to help local out-of-school children complete their studies, ensure the appropriate age children receive compulsory education and promote the development of basic education in underdeveloped rural areas.

Hope Primary School is an important way to improve the conditions of schools in poor areas. According to << “Two Exemptions and One Subsidy” and Hope Project Demand Research Report>> in 2005 from China Youth Development Foundation, 86.7% of the surveyed education department heads and principals considered that school building is the most need for rural educational funding project, 70.0% of teachers hold the same opinion.

For the people who have a willingness to donate but have a weak ability, the China Youth Development Foundation can use the method of establishing a small aid funds to absorb the amount of small public funds. China Red Cross "Jet Li One Foundation Plan", World Vision, Beijing Ai Xin Volunteers Association, etc. are using a small amount of non-directional way to raise funds to manage the funds raised, and at the right time, the funds applied to where needed. While for the donors who have a large amount of donations and who have a long-term contribution will be able to set up a special fund named after the name of the donor under the Hope Primary School Construction Fund. After the completion, these primary school named "hope primary school”. Schools that apply to the China Youth Development Foundation for building Hope Primary Schools can also accept other social donations at the same time. But they cannot name the hope primary schools.

At present, hope primary schools are mainly one-time construction. The hope primary school constructions funds require both the local government and donor

funding. The proportion of funds required for the construction of a desired primary school is 50% for both the donor and the local government and 10% of the donor's funds will serve as the services, management, and administrative costs of the China Youth Foundation. Once the government funds in place, then the donor funds. Construction funds is not a one-time payment, but prepaid. After the completion of the project, the audit and engineering quality inspection will be carried and then the remaining money will be made up.

Due to the limited capacity of the China Youth Development Foundation, after the completion of the construction of hope primary schools, series including teachers' arrangement, equipment and other management matters need to be completed by the government and other relevant departments. The county-level people's government, as the beneficiary representative, assumes responsibility for the management of the construction of hope primary schools including planning, design, progress, capital, quality, and construction safety. The beneficiary counties should set up the hope primary school construction leading group after the establishment of the hope primary school aid project. The members include the county people's government, relevant officials of the Education Bureau and the Communist Youth League. County-level people's government needs to provide the hope primary school construction management funds to county-level Youth League, which should be no less than 2% of the donation. Funding for the management work should not be from Hope Primary School donations.

The designer for the Hope Primary School projects are not only the in-house architects from the CYDF but also sometimes to be the architects from public. The approach for the public architects involves in the design of the Hope Primary School projects are multiple, for example, paid architects, voluntary architects, student competition and student voluntary practice, etc.

The Bridge School project was initiated and designed by architect Li Xiaodong and project manager Chen Jiansheng in 2008. Where Chen Jiansheng is a senior year student of the architect. He had originally identified the need for the project. It was to be fully funded at the beginning by a personal donor, but finally completed in cooperation with an NGO, the China Youth Development Foundation (CYDF) due to financial difficulties. In an interview with project manager Chen (2018), the Bridge School project was initially to be fully funded by a Singapore-based friend of Li Xiaodong through a 500,000 RMB public welfare fund donation. However, due to financial difficulties, only 50% (250,000 RMB/$35,000) of the project could be funded, resulting in the need to find another sponsor to fund the remained to ensure completion of the project. According to Hong and Li (2019:134), to ensure the later operation as a 'Hope Primary School', the CYDF will require 50% of the funds from donors and another 50% from the local government. The Hope Primary School project was launched by the CYDF in 1989 as a public welfare initiative in China, whereby the building of primary schools and funding the disadvantaged students became two major public welfare projects (Hong and Li, 2009:134). The Bridge School project was later implemented as a charitable project by the CYDF, with the

initial private donor providing 50% of the funds through the CYDF and the local government funding the balance. The local government could not make available funds for the entire building- they only came up with half the money that was needed. The architect then embarked on raising the rest. He was successful in getting a sizeable donation from a film star friend in Singapore, and he donated the rest himself (Mallick, 2010:03). In fact, the entire construction cost of the Bridge School was around USD 100,000 (RMB 650,000). Cost/m2= USD 300 (RMB 2,025) including landscaping and site preparations. The cost per square metre is higher than conventional school buildings in that area by about USD 50 per square metre (Mallick, 2010:07). Where the Bridge School project is a fully charitable project, the salary for project manager was paid by Li Xiaodong Atelier and there was no relevant to the project funds.

- **Private Architectural Practice-initiated Projects:**

In recent years, with the strategy of rejuvenating the country through science and education, respecting for talent, and paying attention to education have become the consensus of society. However, the reality is that the proportion of children out of school in rural areas increased year by year and especially the younger age. Architects who concern the basic education issues have organized donations through their own resources and get more resources to help rural primary schools that cannot be extended due to poor school buildings. Architects want to do their best to provide the children with a better learning environment, to ensure their successful completion of their studies.

The Xiuning Shuanglong Primary School was initiated, donated, and implemented by WSP Architects as a private architectural practice charitable project. During the process of the project, there have been different opinions between the local government and the design team. Where the Anhui Education Foundation acted a coordinated unit to help coordinate with the government (Interview with Wu, 2018). But the locals were supportive as there was someone to pay for the bill, which WSP Architects fully funded the design and construction. (Interview with the representative of Xiuning Shuanglong Primary School, 2018). Professor Zhu Jingxiang from the Chinese University of Hong Kong, Li Jiangnan, classmate of chief architect Wu Gang, the Anhui Education Foundation had been invited to visit and select the site. Other architectural professions went to the site to visit, and finally set up such a school. The chief architect had also implemented a case study with a group of statistical students. They did a lot of research, including on-site inspection and functional research. (Interview with Wu, 2018). The design work has cooperated with the Huaxin Design Institute in Hangzhou. Basically, the role of WSP Architects is investing, designing, and assisting the party B to choose the construction partner (Interview with Wu, 2018).

- **University-initiated Projects:**

There are universities and students participate in humanitarian architecture projects in China, however, the number of projects is limited and mainly for rebuilding homes and schools after disaster. Professor Qin (2018) mentioned the reason why Chinese universities rarely participate in such projects in an interview: “Students rarely participate in such projects. First, our actual project process is relatively short and urgent. Sometimes it cannot be deducted from the semester, and it is difficult to match the time. In addition, the training of our students is also problematic, and the actual participation ability is very weak.”

3. Why is the long-term operation of humanitarian school constructions in China needed and how to guarantee that?

There is not a complete public welfare system with evaluation system and standards in China currently. The lack of standards and well-established systems makes it difficult to ensure the long-term success of the humanitarian school construction projects.

4. What are the most basic needs of the disadvantaged communities in China, and how can these basic needs related to education can be satisfied using architectural solutions? How could architects balance between the local basic needs and architectural design innovation?

In the research process, the basic needs involved in each project are not exactly the same, but the whole can be summarized in the following aspects. Firstly, the local

area needs a basic space for children to learn. Secondly, this space needs to be sufficiently safe and easy to maintain. Architects need to design the school based on the local climate and surrounding environment, combined with the lifestyles and desires of local villagers. Sufficient field visits and communication with local villagers are essential. Architects need to abandon exaggerated design concepts and return to simplicity, so that the building meets the most basic conditions for students to learn. In terms of building materials and structures, try to adapt to local conditions and use local materials, which not only makes the building more adaptable to the surrounding environment, but also reduces the construction cost and the difficulty of subsequent maintenance. New materials should be used when the experimental data is sufficient, and the methods for later maintenance should be taught to the villagers. In addition, guiding villagers to participate in the design and construction will make the final construction results more in line with the basic needs of the villagers.

5. How could designers balance between public voice and personal economic needs when engaged in humanitarian architecture in the provision of schools in China?

In charity projects, designers have the right to choose whether to charge design fees. Charity does not only mean taking out money or not charging fees, but it is also involving using professional skills to help specific groups solve problems. Architects need to ensure their basic living needs when doing charity projects.

In some cases, even if the designer does not need to make a profit, he still needs to charge a certain design fee for the project to meet the basic salary of the project-related staffs. Take the Xiashan Primary School project for example, as a government 'demolition and resettlement project', it was fully government funded, using the proceeds from land sales, however, the design fee for this project was 30% to 40% lower than typical projects (Interview with Qin, 2018). In fact, most of the design fee went to the engineers of the Architectural and Design Institute of Zhejiang University for their cooperation. The architect himself did not make a profit from the project. Under normal circumstances, architects will use part of the profit from other commercial projects for public welfare projects (Interview with Qin, 2018).

While in Bridge School Project and Shuanglong Xiuning Primary School project, the architect did not charge design fees because these two projects were partially or fully funded by the architect team.

6. Why should humanitarian architecture in the provision of schools should be standard (construction, stability, standard, prefabrication) and how could prefabricated humanitarian architecture meet the local circumstances in relation to the provision of schools in China?

Prefabricated structures mainly applied on humanitarian architecture in post-disaster field, due to its easy construction, convenience, and cost saving properties. However, here is not enough data about prefabricated humanitarian architecture in this research.

Within the three case studies, only Xiuning Shuanglong Primary School uses a prefabricated steel structure. The architect Wu emphasized in an interview (2018) that “We consider that the children sit here and learn, don't be distracted, so the windows are designed to come in diffuse light, without direct light. We hope that the whole construction process is low-carbon and environmentally friendly and meets a good building standard. Therefore, the prefabricated light steel structure is adopted, and some environmentally friendly materials are used. The façade of the classroom has two layers of skin so that it can be ventilated in the summer and warm in the winter. We have fewer aesthetic considerations. We think more about the physical properties and the quickness of construction. How can it be faster, and the implementation does not affect the children's reading?”

However, there were some major problems in the school usage. Until field work in September 2018, there were 50 students and 4 teachers in the Xiuning Shuanglong Primary School, and students on this campus were from the first year to the third year. Because of the classroom height problems caused by the increasingly structural subsidence, senior children needed to move to another campus to have higher classrooms that could meet their daily use requirements. The temperature is too high in the summer due to non-insulation inside the room resulted by the new metal material. Then during the visit, it was found that incandescent lamps were needed in the classroom during the day, otherwise the light would be insufficient to meet the learning needs. This resulted by the high window opening position for diffused light.

Finally, the structural subsidence need maintenance, but the maintenance cost was high.

Therefore, before adopting the prefabricated structure, the architect should conduct a complete investigation of the local climate environment, conduct sufficient tests according to the geographical situation, and consider subsequent maintenance.

7. How successful is the current process of humanitarian architecture in China and what are the unsuccessful aspects and how to improve?

There is not a complete system of humanitarian architecture with evaluation system and standards in China.

The following are some key disadvantages of the current process of humanitarian architecture in China:

- Funds are not transparent, donors cannot know the application of each payment
- There is no rating standard for the completed building
- Lack of an open and prestigious platform to share resources in humanitarian architecture fields
- In the Hope Primary School projects in China, there are not many schools designed by architects with aesthetic considerations, most of them are very simple standard teaching building designs.
- Architects participating in humanitarian construction should not only be to realize their ideals, but to really help the local communities.

- Among the current humanitarian construction projects in China, the proportion of post-disaster reconstruction is still the largest. And there is a lack of participation of university architecture students and locals

8. Why should sustainable design solutions be provided to the disadvantaged communities of China?

Sustainable design solutions can be discussed from two areas, from the process of the construction to the post-maintenance and end use. Especially for the disadvantaged communities, sustainability is extremely important. During the construction process, architects should not only consider whether the building materials are environmentally friendly, suitable for the local environment, easy to obtain materials, and easy for later maintenance, but also whether the built building is environmentally friendly in terms of energy and meet the basic needs of users. Both the Xiuning Shuanglong Primay School and the Xiashan Primary School have problems in daylighting and energy consumption in actual use. The timber material used in the Bridge School is expensive and not from the local area, which increased the post-maintenance fees.

9. Is there any university-affiliated design/build studio or community design centre in China? If not, how could this be introduced to China?

There is not known university-affiliated design and build studio or community design centre in China. There are indeed some design camps involving humanitarian

construction projects, but there are very few large-scale school construction projects. This type of camp is generally small in scale and short in time. It is mainly for young architects and students to communicate with each other and provide an opportunity for young architects to participate in actual design. These camps are different from university-affiliated design and build studio or community design centre because they do not run design and build projects regularly.

Conclusion

The key aim if this research to be achieved in this thesis was to "understand and help improve the non-disaster relief humanitarian architecture process in the provision of schools in the disadvantaged communities of China and then discuss the potential to propose an improved model for the practice of humanitarian architecture in China." This chapter has analysed and discussed the research results by answering each of the four key research questions and sub research questions.

Through the analysis of the materials obtained from the literature review and case study, the definition of humanitarian architecture in China has been clarified, how humanitarian architecture within specific Chinese context works has been explored and the efficiency of professional services provided by the architects has been discussed.

This chapter has also identified the needs for an improved model for the practice of humanitarian architecture in China and discussed some considerations to consider when established such a model. First, there is not a unified standard of how to manage a humanitarian architectural project in the Chinese architectural community. Then the roles and responsibilities of architects in China has shift from simply focusing on professional skills to also occupying the social responsibilities. Most of important, there is not a complete evaluation system for the long-term monitoring of the humanitarian architecture projects in China. There are some shortcomings of current humanitarian architecture process in China: For example, how to use the funding is not transparent, donors cannot know the application of each payment, there is no rating standard for the completed building and there lacks an open and prestigious platform to share resources in humanitarian architecture fields, especially a lack of participation of university architecture students and locals. Therefore, it is essential to build upon a developed model of humanitarian architecture process in China, with a more transparent financial system and more contribution from the locals. Architects working on humanitarian projects should aim to do more than just achieve their goals; they should also aid the local communities. It is valuable to provide more opportunities for the university young professions to take part in such humanitarian projects.

Chapter 6: Research Conclusions, Limitations and Scope for Further Research

Introduction

This chapter will discuss the limitations of this PhD research and how they have affected the findings in order to make suggestions for potential future research. The research limitations will be described and discussed in this chapter and any possible impacts on the research findings explained in terms of both the methodological limitations, and the limitations of the researcher aspects.

6.1 Main Research Conclusions

This section will briefly summarise the research content and the results of this research. The key findings of this research can be concluded as the following:

First, the definition of humanitarian architecture, the history and evolution of humanitarian architecture, the arguments for humanitarian architecture and how do current humanitarian architecture practices operate have been discussed from both global context and particular Chinese context to find the research opportunity of this

research. As discussed in the literature review, humanitarian architecture provides solutions in response to natural- and man-made societal or environmental problems and its scope can be broadly classified into two categories: 'post-disaster' projects; and 'socio-economic community development' projects. These are often referred to under many guises, such as "public interest design", "community design", "design for the broader good", "pro-bono design", "socially conscious, socially just, and socially aware design", as well as "asset-and needs-based design" (Wilmes, 2015). The definition of humanitarian architecture has changed through history. In terms of the definition of humanitarian architecture in China, although humanitarian architecture has been undertaken in China, it has not been under the 'humanitarian' banner due to cultural reasons. Indeed, the term 'humanitarian architecture' is not recognised by the Chinese architectural community and similar descriptions tend to refer to "architects involved in the humanitarian field" or "an architect with a humanitarian spirit". Apart from these, humanitarian architecture in China is still developed in process and research on non-disaster relief projects which focus on socioeconomic development is rare, this has therefore provided an interesting and relevant research opportunity for this PhD research.

Second, to meet the community needs appropriately, in-depth case studies and partnership with local government should be adopted in the humanitarian architecture projects in the provision of schools, this has been demonstrated in the literature review and in the case studies.

Then in accordance with the barriers and drivers to humanitarian architecture in China, there are three key barriers identified from the case studies:

- How to best use the charitable funds, the need to establish an evaluation system and standards, and to establish a comprehensive public welfare system is a massive task to complete.
- The lack of unified standard of humanitarian architecture in China.
- Communication with the locals is another key barrier.

Finally, there are some important lessons that can be learned from the case studies in relation to future 'humanitarian-type' projects to enhance the process of humanitarian architecture to ensure contextually relevant and successful outcomes in China:

- The importance of close engagement, collaboration and clear communication with the local community and local government
- The importance of clear funding mechanisms
- The importance of clear understanding of contextual policies
- The importance of careful understanding of the needs of the end-users

Additionally, this study has examined the research findings by addressing each of the sub-research questions. The following conclusions can be drawn in the light of these findings:

1. The responsibilities of architects participating in humanitarian architecture classified into two categories: legal responsibilities and social responsibilities.
    - Legal responsibilities: Compared with other conventional construction projects in China, the responsibilities of architects participating in humanitarian architecture projects have been shifted from a technical service provider to a multi-identity worker and the architects not only in charge of the design phase of the projects, but the project inception, designing, construction to the post maintenance phases.
    - Social responsibilities: The social responsibilities of architects participating in humanitarian architecture projects is something related to but not limited to their professional field. Fully understand the living habits and production needs of residents, apply low-cost suitable technologies, encourage villagers to participate in community construction, respond to the demands of villagers demands, and promote rural construction and development. The value of "architects serving the public" is exactly the social value of architecture and the professional social responsibility of architects.

2. The different delivery mechanisms of humanitarian architecture projects in relation to the provision of schools in China and how they can be improved have been investigated in this study: there are government-initiated projects, NGO-initiated projects, private architectural practice-initiated projects, university-initiated projects, and compony-initiated projects. However, after investigation of the three cases, it was founded that these mechanisms sometimes overlap. For

example. as a government demolition and resettlement project, the Xiashan Primary School is initiated, sponsored, and operated by the local government, but the STI Studio was commissioned to complete the project as a private architectural practice. The Bridge School project was initiated and designed by architect Li Xiaodong and project manager Chen Jiansheng, but finally completed in cooperation with an NGO, the China Youth Development Foundation (CYDF). While the Xiuning Shuanglong Primary School was initiated, sponsored, designed by WSP Architects as a fully private architectural practice-initiated project.

3. There is not currently a complete public welfare system with an evaluation system and standards in China. The lack of standards and well-established systems makes it difficult to ensure the long-term success of the humanitarian school construction projects. It is therefore essential to build up a long-term operation system of humanitarian school constructions in China.

4. In order to satisfy the needs of end-users, the architects involved in humanitarian architecture need to strike a balance between the basic needs of locals and architectural design innovation. As discussed in Chapter 5, architects need to design the school based on the local climate and surrounding environment, combined with the lifestyles and desires of local villagers. Sufficient field visits and communication with local villagers are essential. Architects need to abandon exaggerated design concepts and return to simplicity, so that the building meets

the most basic conditions for students to learn. In terms of building materials and structures, try to adapt to local conditions and use local materials, which not only makes the building more adaptable to the surrounding environment, but also reduces the construction cost and the difficulty of subsequent maintenance. New materials should be used when the experimental data is sufficient, and the methods for later maintenance should be taught to the villagers. In addition, guiding villagers to participate in the design and construction will make the final construction results more in line with the basic needs of the villagers.

5. In addition, the architects also need to balance between public voice and personal economic needs when engaged in humanitarian architecture in the provision of schools in China. Charity does not only mean taking out money or not charging fees, but it is also involving using professional skills to help specific groups solve problems. Architects need to ensure their basic living needs when doing charity projects. In some cases, even if the designer does not need to make a profit, he still needs to charge a certain design fee for the project to meet the basic salary of the project-related staffs.

6. There is not enough data about prefabricated humanitarian architecture in this research, however, the Xiuning Shuanglong Priamry School project has prefabricated steel structure. It is essential to conduct a complete investigation of

the local climate environment, conduct sufficient tests according to the geographical situation, and consider subsequent maintenance.

7. Sustainable design solutions should be provided to the disadvantaged communities from the process of the construction to the post-maintenance and end use. Especially for the disadvantaged communities, sustainability is extremely important. During the construction process, architects should not only consider whether the building materials are environmentally friendly, suitable for the local environment, easy to obtain materials, and easy for later maintenance, but also whether the built building is environmentally friendly in terms of energy and meet the basic needs of users.

8. There is not known university-affiliated design and build studio or community design centre in China.

9. In conclusion, there is not a complete system of humanitarian architecture with evaluation system and standards in China. There are key disadvantages of the current process of humanitarian architecture in China:
    - Donors have no idea how their money is being used since funds are not transparent.
    - There is no grading system in place for the finished structure.

- In humanitarian architecture field in China, there is a need of an open and renowned platform to exchange resources.
- There is a dearth of involvement from residents and university architectural students.

There is not a complete system of humanitarian architecture with evaluation system and standards in China. Therefore, these key findings can be developed in a guide to support the future development of humanitarian architecture in China:

1. The responsibilities of architects participating in humanitarian architecture projects have been shifted from a technical service provider to a multi-identity worker and the architects not only in charge of the design phase of the projects, but the project inception, designing, construction to the post maintenance phases.
2. In terms of the social responsibilities of architects participating in humanitarian architecture projects, the architects should fully understand the living habits and production needs of residents, apply low-cost suitable technologies, encourage villagers to participate in community construction, respond to the demands of villagers demands, and promote rural construction and development.
3. There are government-initiated projects, NGO-initiated projects, private architectural practice-initiated projects, university-initiated projects, and compony-initiated projects. However, these mechanisms sometimes overlap.

4. It is essential to build up a long-term operation system of humanitarian school constructions in China.
5. The architects working in humanitarian architecture must find a balance between the demands of the native community and architectural innovation:
    - The architects shall design the school in accordance with the local climate and ecology, as well as the habits and desires of the villagers.
    - Sufficient field trips and interactions with locals are crucial.
    - To provide a learning environment that serves the most fundamental needs of children, architects must avoid too complex architectural principles.
    - Building materials and structures should be adapted to local circumstances and local resources, which not only improves the building's adaptability to the surrounding environment, but also decreases the construction cost and difficulties in maintaining.
    - New materials should be employed when the experimental data is adequate, and the procedures for future maintenance should be taught to the villages.
    - Guidance in encouraging villagers to engage in the design and building process will result in final construction outcomes that are better in accordance with fundamental requirements of the villagers.
6. The architects working in humanitarian architecture must also find a balance between public voice and personal economic needs.

7. It is imperative that disadvantaged communities have access to sustainable design solutions throughout the building process, including post maintenance and usage.
8. The funds system should be more transparent for future humanitarian architecture process in China.
9. There is no grading system in place for the finished project. It is potential to build up such a grading system to evaluate the humanitarian architecture projects in China.
10. There is a need of an open and renowned platform to exchange resources in the humanitarian architecture field in China,
11. There is a lack of participation from local villagers and university architecture students. For future humanitarian architectural projects, it is worth to encourage more engagement of local villagers and university architecture students.
12. Finally, humanitarian school projects are not exempt from the school design codes in China. China's Primary and Secondary School Design Code GB50099-2011 supervises all humanitarian school projects in China.

6.2 Research Limitations of this PhD Research

There are research limitations from both methodological limitations, and limitations of the researcher aspects for this PhD research:

1. **Sample Size:** As mentioned in previous chapters, this PhD research adopts qualitative research methodology. The case study is the main research method for this research with sub-research methods including a literature review, interviews, focus groups and participant observation. The case studies were carried out by selecting three cases, expected to each be from different delivery mechanisms (NGO-initiated project; private architectural practice-initiated project; and university-initiated project). However, the number of cases limited the possible changes during the research. After the investigations of the three cases, it was found the Xiashan Primary School is not a university-affiliated project, but a project initiated by government and under the control of a private architectural practice. Therefore, to investigate the different delivery mechanisms in a more detailed and typical manner, one more sample would help to supplement the shortcomings of the limitation of the cases.

2. **Lack of available data:** In the instance of the Bridge School Project, the number of people who could be interviewed was significantly lower than anticipated. It was anticipated that interviews would be conducted with Li Xiaodong, the lead architect for the Bridge School project; however, after sending emails to the architect, the architect declined the interview request made through his student. For example, the China Youth Development Foundation is prohibited from disclosing information about particular initiatives, including information about contributors and funding, due to existing policy constraints. On the other hand,

requests for general information were turned down by the organization's management. Furthermore, because of the frequent changes in government personnel, it was impossible to get in touch with the government officials who were in power at the time of the project's construction. As a result, interviews were conducted exclusively with Chen Jiansheng, the project manager for the Bridge School project, via WeChat interviews and with locals from the surrounding area during the on-site site visit. Due to the limited number of people contacted, the descriptions and opinions on the project of the Bridge School project only come from a limited number of personnel and literature reviews. Apart from this, for both the Bridge School project and the Xiashan Primary School project, there were missing contacts with local government officials. As all the primary school constructions in China must have government participation and approval, the research materials will be enriched if government staff can be interviewed. Although the architect Qin Luofeng has provided scanned official documents on the project communication between the design team and the government, which in a sense made up for the lack of information.

3. **Access:** Access difficulties was another key factor to deal with when conducting the case studies. the three cases are in three different geographic locations within China, and were all unfamiliar to the researcher, especially both the Bridge School and Huangshan Xiuning Shuanglong Primary School are in mountainous areas which were challenged to find the location. However, as upon arrival at the site of the Bridge School, the person who held the key for the upper classrooms

was not in the village, the interior of classrooms was unavailable for access. Due to the researcher having a second baby and the Covid-19 travel restrictions, return visits could not be undertaken. In terms of the Xiashan Primary School, although the researcher went into the campus successfully, she was not allowed to photograph inside the school.

4. **Methods used to collect the data:** Due to time and contacts availabilities, it was not possible to conduct the focus groups as planned. In addition, the duration of participant observation could have been extended over a longer period. Future studies could explore the use of focus groups and participant observation for extended periods of time.

5. **Lack of prior research studies on the topic:** Currently, there are no known PhD level research projects in China focused on non-disaster relief humanitarian architecture, although research on new rural building or master's degree research on charity school projects are present. The quantity of humanitarian school construction is huge, yet there is little research on humanitarian school projects from a worldwide perspective. However, this gives opportunity to this PhD research to begin to investigate the process of humanitarian school projects in the disadvantaged communities to a higher level.

6.3 Suggestions for Further Research

This PhD research has provided an extensive literature review on humanitarian architecture in relation of schools in the Chinese context at a PhD level which can benefit future research. There are a range of suggestions for future researchers to conduct the case studies from ideas on both external factors and individuals. Firstly, a researcher should always be prepared for elements to change and to be mindful of any potential external influences upon the case study as there are always unpredictable factors. Secondly, each participant in the case study has their own unique personality, which should be considered and represented in the research. Thirdly, the researchers should be aware that political sensitivities may sometimes create barriers to access and information. Additionally, a well-structured timetable and travel plan are critical, which will assist the researcher. And it is critical to collect meticulous and exhaustive field notes throughout the study. Finally, there would be more evidence if the duration of the cases study could be longer, and the focus groups could be achieved.

6.4 Conclusion

The research in this thesis has approached the phenomenon of humanitarian school projects for under-developed communities in China by focusing on three specific case studies, the Bridge School project, the Xiashan Primary School project, and the Xiuning Shuanglong Primary School project. This thesis has been divided into six chapters to fully understand and improve the process of humanitarian architecture in China in relation to the provision of schools for disadvantaged communities. In the first chapter, the research background has been introduced, the research motivation, research agendas including research gap, research aims, and objectives have been identified with research questions. Then in the second chapter, the research background has been described in more detail with literature review from international context to specific Chinese context. In the third chapter, the methodology for this research has been discussed. In the fourth chapter, detailed information on how the case studies were carried out in the field work with data collected from the field work has been evaluated. Chapter five has processed the results, synthesis, and discussion for the research. In the final chapter, both advantages and limitations of this PhD study have been discussed to draw lessons for any future work. Overall, this thesis has critically analysed the current non-disaster relief humanitarian architecture process in the provision of schools from the process inception to realization, until post construction and discussed the potentials to propose an improved model for the practice of humanitarian architecture in China.

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Appendix 1:

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

RESEARCH INFORMATION SHEET

Project Title: Humanitarian Architecture and the Creation of Schools for Disadvantaged Communities in China

Researcher's Name: Hang Du

Supervisor's Name: Prof. Tim Heath

1. What is the purpose of the research?

Research Objectives: The overriding objective of this research is to fully understand the process of humanitarian architecture in the provision of schools for less advantaged communities in China.

Research Aims: The central aim of this PhD research is to understand and help improve the Non-disaster relief humanitarian architecture process in the provision of schools in the disadvantaged communities of China. The thesis will critically analyze the current non-disaster relief humanitarian architecture process in the provision of schools from the process inception to realization, until post construction and then proposed an improved model for the practice of humanitarian architecture in China.

2. Who will be conducting the research?

Hang Du, a PhD (Architecture and Social Sciences) researcher from the Department of Architecture and Built Environment, the University of Nottingham, will conduct the research.

3. Who is sponsoring the research and what are the terms of the sponsor?

This research is not sponsored by any official or non-official organisation. The data will be kept and protected by the researcher during the study time and will be destroyed in the phase of post research.

4. What is the nature, purpose and duration of the study?

Case Study is the main research method for this study, following with interviews, observation and documentation. The research will be conducting semi-structured interviews with 10-15 participants for the case study. The participants are selected by their relationships with selected case studies, including architects, officials, teachers, people from local communities). The duration of the interview will be between 45 to 60 minutes. The interviews will be conducted through Face to Face, Phone or WeChat, based on the interviewee preference. All documents will be provided to potential interviewees in both English and Chinese (Mandarin) and the interviews will be conducted in Chinese (Mandarin), the researcher's native language.

5. Who will be asked to participate in the research?

The interview aims to collect data from different typologies of people involved in the selected humanitarian school projects, including: Architects; Architects involved in humanitarian school projects; Projects manager of selected humanitarian school projects; NGO Staffs; Officials of local government and education bureau; Teachers working in selected humanitarian schools and Parents of students in selected humanitarian schools.

Interview questions are related to process of humanitarian architecture; interviewees' involvement; interviewees' experiences good/bad; interviewees' ideas on potential for improvement/change.

6. Whether participants will be paid?

To participate in this research is voluntary; it is up to you to decide, there is no payment or expenses associated with participating in the research. Emails/ Official letters will be sent to potential interviewees to invite them to participate in the research. Before the interview, interviewees will be sent the interview questions and consent form. The interviews will be conducted once the potential interviewees have approved and signed the consent form. In addition, interviewees hold the freedom to withdraw from the study at any time without giving a reason.

7. What procedures will be employed to maintain confidentiality and anonymity?

Information will not be accessed or used by anyone else apart from the researcher and supervisor. The interviewees will be given the options in the consent form if they want their personal information to be identified or not.

During the research, all photos, videos and audios taken by the researcher will be stored in a password protected filed and stored in a locked filing cabinet and scanned to be stored digitally on a password protected external hard drive. The researcher and supervisor will be the only person with access to the raw data. All data handling and storage will be in line with the University of Nottingham Research Code and Research Ethics of Conduct. The data will be archived in the university record storage facilities for seven years after the research completion and the degree has been awarded.

The participant is free to decline to take part or withdraw from the study at any time. If they decide after the interview to withdraw, their data will not be included in the study.

Contact:

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Appendix 2:

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

PARTICIPANT CONSENT FORM

Project Title: Humanitarian Architecture and the Creation of Schools for Disadvantaged Communities in China

Researcher's Name: Hang Du

Supervisor's Name: Prof. Tim Heath

- I have read the Participant Information Sheet and the nature and purpose of the research project has been explained to me. I understand and agree to take part.
- I understand the purpose of the research project and my involvement in it.
- I understand I am free to withdraw from the study at any time
- I understand that information gained during the study may be published; my name and position will be identified unless I prefer my identity to be anonymous where my personal results will remain confidential.

☐ I prefer my identity to be anonymous and my personal information and results to be confidential.

- I understand that I will be audio recorded during the interview.
- The Interview will be conducted using face to face, WeChat or over the phone, can you please indicate your preference:

☐ *face to face* ☐ *WeChat* ☐ *over the Phone*

- I understand that data will be stored on an external hard drive and will be protected by password. After finishing the research, the data will be archived in the university record storage facilities for seven years after the degree has been awarded and disposed of, according to the university data storage policy.
- I understand that I may contact the researcher or supervisor if I require further information about the research, and that I may contact the Research Ethics Coordinator of the Faculty of Engineering, University of Nottingham, if I wish to make a complaint relating to my involvement in the research.

Signed …… (research participant)

Print name ……

Date ……

Contacts
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Supervisor: Prof. Tim Heath
Faculty Ethics Committee: ez-eng-ethics@nottingham.ac.uk

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

参与者同意书

研究课题： Humanitarian Architecture and the Creation of Schools for Disadvantaged Communities in China

研究者： 杜航 Hang Du

导师： Prof. Tim Heath

- 我已经阅读了参与者信息表，并了解了研究项目的性质和目的。我理解并同意参加。
- 我了解研究项目的目的和我的参与。
- 我知道我可以随时退出研究。
- 我了解在研究过程中我的信息可能会被发布，我的姓名和职位将被确认。除非我希望我的身份是匿名的，那么我的个人结果将会被保密。

☐ • 我希望我的身份是匿名的，我的个人信息和结果是保密的。

- 我知道我会在采访中被录音。
- 采访将采用面对面、微信或电话方式进行，您能否说明您的喜好：

☐ *面对面* ☐ *微信* ☐ *电话*

- 我知道采访数据将存储在外部硬盘驱动器上，并受密码保护。根据学校的数据存储政策，在完成研究后，这些数据将在授予学位的7年内被保存在大学的记录存储设施中。
- 我了解如果我需要关于研究的进一步信息，我可能会联系研究人员或其导师，如果我想投诉这次参与的研究，我可能会联系诺丁汉大学工程学院的研究伦理协调员。

签字 ..... (参与者)

姓名 ..... **日期** .....

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