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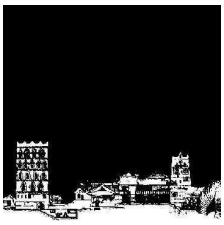

TRADITIONAL DWELLINGS AND SETTLEMENTS WORKING PAPER SERIES

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REMAKING CHINA'S URBAN COMMUNITIES FOR MODERNITY: THE MORPHOLOGICAL TRANSFORMATIONS AND EVERYDAY ACTIVITIES OF DANWEI COMPOUNDS IN XI'AN

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Danwei (also known as Working Unit) compounds have been a distinctive and fundamental urban form in today's cities in China since the founding of the People's Republic of China in 1949. Shaped by the planned economy and socialistic experience imported from the Soviet Union in early 1950s, Danwei compounds emerged as self-contained urban communities centered on individual state-owned factories, institutions, enterprises, or working units, offering a full set of facilities, such as housings, shops, health clinics, schools, and other essential services and amenities for daily life. Enclosed by walls, each Danwei compound was a gated work-life mixed community occupied by hundreds or thousands of urban residents. As a primary urban form in every city in China in the second half of the 20th Century, Danwei compounds not only had enormously contributed to the physical characteristics of China's urban spaces for over half century, but also had considerably shaped hundreds of millions of Chinese urban residents' social lives and well-beings during the planned economy era. Since the 1990s when China's planned economy was gradually replaced by market-oriented economy, every city has seen accelerated urban growth and the daily lives within Danwei compounds have experienced fundamental changes. Some traditional Danwei compounds have been dissolved and replaced by new real estate developments while many are attempting to revitalize themselves with spatial renovations and redevelopments.

Current studies on Danwei compounds mainly concentrate on the spatial characteristics and social implications of those compounds at the macro level. However, few studies pay attention to the residents of those Danwei compounds and explore how morphologies of Danwei compounds interact with the residents' daily lives. Also, most existing literature treats Danwei compounds as isolated urban islands, failing to address the interactions between them and their immediate surroundings.

In order to fill the research gap, this study considers Danwei compounds a fundamental spatial structure that links the urban forms of Chinese cities from the socialistic past to the market-driven present and a sustainable future, and also a territorial unit in which urban residents' everyday activities take place. Taking a time domain comparative study on three Danwei compounds in Xi'an, China, this paper examines the morphological changes of Danwei compounds based on the shifting social, cultural, and economic demands of residents' daily lives. By comparing the social, cultural, and economic elements and spatial outcomes from the three cases in different time periods, this paper seeks to provide a practical framework for the in-depth spatial analysis of Danwei compounds by completing research works in the following four areas: 1) identifying the morphological typologies of today's Danwei compounds based on the changing spatial forms and daily lives, 2) summarizing the patterns of morphological evolution of Danwei compounds in the past 60 years, 3) analyzing the mechanism of interaction between daily life activities and spatial forms both inside and outside of Danwei compounds, and 4) demonstrating the possible morphological patterns of Danwei compounds in near future.

1. INTRODUCTION

The forms of urban residences in China's cities have experienced four major changes in the past century: traditional courtyard-based residence until the 1920s, early modern residences primarily influenced by the Western planning and design principles from the 1920s to the 1950s, Danwei-based public residential compounds influenced by Soviet planning and design principles from the 1950s to the 1990s, and market-based residential districts inspired by today's Western modernist planning and design. Among them, the

Danwei Residential compounds, imported from the Soviet Union during the beginning of the planning economy period in the 1950s, have become the primary forms of Chinese cities and deeply changed the spatial orders and features of Chinese cities for over 40 years, still shaping today's urban landscape of China.

During the socialistic planning economy period (1950s-1990s), a Danwei refers to a state-run workplace, such as a school, factory, hospital, government agency, or educational institute that provides not only employments but also fundamental life benefits to its employees. As a state production administrative system, Danweis across the whole nation employed the majority of urban residents in China. By 1978, over 95% of Chinese urban workers were employed by a Danwei.[1] Spatially, a Danwei is often identified as a compound, in which a gated work-residence mixed neighborhood is formed with the enclosure of walls. Inside the compound, there are workplaces, employees' housings, and a wide variety of infrastructures and facilities, such as cafeterias, shops, clinics, schools, recreation centers, and open spaces, supporting most needs of employees' work and life. As a result, each Danwei residential compound put in place an inward urban neighborhood within which the lives of most urban residents are organized. The critical significance of Danwei residential compounds in today's China lies in its unique combination of China's urban residents' economic, social, cultural and political lives.

As the primary form of Chinese cities in the second half of the 20th Century, Danwei residential compounds become an efficient and effective approach to improve urban environment, supporting housings and life needs for millions of urban populations, developing the qualities of urban life and wellbeing, and reshaping the spatial features of today's cities and urban residents' everyday lives. However, China's rapid and massive urban development since the 1990s has resulted in a fundamental transformation of the spatial organization in the cities and brought large shifts of urban residents' life patterns. In every city, many Danwei residential compounds have been replaced by market-based real estate developments while other Danwei residential compounds are undergoing major renovations and redevelopments to adapt into new urban socioeconomic orders.

The study of Danwei residential compounds' renovation and redevelopment has gradually gained academic attention since the 1990s. In China, today's studies mainly concentrate on three aspects: 1. Centering on, from the macro-level, the influence of existing Danwei residential compounds on the spatial compositions and structures of today's cities and residential life patterns[2], and the development models to integrating Danwei

[1] Lu, D.F., "Everyday Modernity in China: From Danwei to the "World Factory," *Fudan Journal of the Humanities and Social Sciences*, 12 (2019): p.79-91.
[2] Feng, D., ""Gated Community and Residential Segregation in Urban China," *Geo Journal*, 82, 3(2017): p. 231-246.

residential compounds into today's urban spaces[3]; 2. Exploring strategies and to renovate and redevelop existing Danwei residential com (Lu 2019)pounds by promoting spatial sharing[4], and the way of redevelopment based on different users' needs[5]; and 3. seeking approaches of redevelopment by revitalizing infrastructures and amenities within each Danwei residential compound such as improving inner roads and streets[6] and multi-level layouts of infrastructures and amenities[7] (Wang, et al. 2017). In general, existing studies are primarily interested in the aspects of policy and economic impacts of Danwei residential compounds, their physical forms, and the needs of renovating internal infrastructures and facilities. However, few studies concentrate on the interactions between the Danwei residential compounds and their immediate surrounding contexts, and between the residents' everyday life patterns and the spatial responses within the Danwei residential compounds.

Theoretically, this study considers the creation and development of Danwei residential compounds in China during the 1950s-1990s were based on the spatial advantages that they created to fit the planning economy system implemented during that period of time. Under that system, economic and social resources were centrally controlled and distributed according to predetermined economic and social objectives. Each Danwei residential compound is a perfect spatial mechanism to achieve that centrally control and distribution by creating an enclosed community that heavily relied upon major life resources and infrastructures internally provided by the state employer. However, the transition from the planning economy to market-based economy in the 1990s restructured the control and distribution of urban economic and social resources in Chinese cities. When economic and social resources became easier to access outside of the state employer's control, the spatial advantages of Danwei residential compounds started to dissolve. The enclosed compounds not only physically separated Danwei neighborhoods from their surrounding urban contexts, but also impeded the functioning of infrastructures and facilities inside Danwei compounds when they lost their original users, which made Danwei compounds harder to access to support and resources for their renovation and revitalization, and consequently led to further isolation and declination of those Danwei compounds. Therefore, the challenges facing by many Danwei residential compounds in today's cities in China reflect that Danwei residential compounds fail to support emerging needs and new functions brought by socioeconomic

[3] Cheng, L., "Relevancy Between Danwei Compound and Urban Physical Spatial Form of Nan Chang China," *Journal of Southeast University* (2016).
[4] Yang, C.M., X. Z. Zhang, & X. J. Li, "Spatial Renovation of Adjacent Residential Districts for Mixed Living," *Architectural Journal* no. 3 (2013): p.8-12.
[5] Huang, M.H., X.H. Guan, Q. Zeng, & Y. Wang, "Pros and Cons of Residential Neighborhood Transition," *Journal of Planners* 33, no. 3 (2017): p.108-113.
[6] Yu, Y.F., "From the Planning of Traditional Residential Neighborhoods to the Planning of Neighborhood Life Circle," *Urban Planning* 43, no. 5 (2019): p.17-22.
[7] Wang, Z.Y., C. Li, T.X. Yang, L. Yang, & Y. Wang, "Pros and Cons of Residential Neighborhood Transition." *Journal of Planners* 33, no. 3(2017): p. 108-113.

changes and fast urban development and demand critical reforms in order to maintain an essential component of today's urban communities. This paper is aimed to examine the spatial connections and interactions among Danwei residential compounds, the surround urban contexts, and Danwei residents' everyday life patterns by taking three cases of Danwei compounds in Xi'an, China. Particularly, this paper focuses on: 1) identifying the morphological typologies of today's Danwei compounds based on the changing spatial forms and everyday lives, 2) summarizing the patterns of morphological evolution of Danwei compounds in the past 60 years, 3) analyzing the mechanism of interaction between everyday life activities and spatial forms both inside and outside of Danwei compounds, and 4) demonstrating the possible morphological patterns of Danwei compounds in near future.

2. METHODOLOGY

Taking mapping and spatial analysis, this paper studies three Danwei residential compounds in Xi'an, the largest city in Northwest China and a major urban center for economic and cultural activities. Since the 1950s, Xi'an has been the home for many state institutions, enterprises, and agencies, and developed many Danwei compounds. Based on the nature of the Danwei Employer, this paper classifies all 966 Danwei residential compounds in Xi'an into two categories: State Enterprise / Public-Sector Compounds, and Higher Education Institution Compounds. Two cases, the Compound of Xi'an Metallurgical Plant (Compound A), and the Compound of Xi'an Railway Administration (Compound B), are selected from the category of State Enterprise / Public-Sector Compounds while one case, the Compound of Xi'an University of Architecture & Technology (Compound C) is selected from the category of Higher Education Institution Compounds. Each case was built in the 1950s – 1960s on state-granted urban lands based on classic neighborhood unit planning principles that were featured by a hierarchy of internal streets, a continuing enclosed wall along the perimeter to divide the compound from surrounding urban contexts, and only two or three entrances linking to the outside urban streets. All the three cases indicate different layouts with different scales (Fig. 1). After over four decades of growth and development, each of those three Danwei residential compounds have become a home of a mini city with full scale infrastructures and amenities, such as kindergartens, elementary schools, secondary schools, dining halls, restaurants, café shops, retail stores, marketplaces, laundries, hair salons, clinics and hospitals, recreational centres, post offices, and so on.

The Compound of Xi'an Metallurgical Plant (Compound A) occupies a 9.5-hectare urban area with 33 residential towers used by 2,100 families. In Compound A, there are one preschool /kindergarten, one elementary school, one secondary school, one regular hospital and one comprehensive hospital. The Compound of Xi'an Railway Administration (Compound B) is the home of about 7,000 families on a 35.1 hectares urban land with 68 residential towers. Compound B has one preschool /kindergarten, two

elementary schools, one secondary school, and one comprehensive hospital. The Compound of Xi'an University of Architecture & Technology (Compound C) has 46 residential towers on a 14.9 hectares land, supporting lives of 3,100 families. Compound C is the home for one preschool /kindergarten, one elementary school, one secondary school and one regular hospital. In terms of residential population and size of the compounds, those three cases provide a comparative study of urban morphological changes for small-, middle-, and large-scale Danwei Compounds.

According to the major events of social and economic changes in China, this paper examines the transformations of Danwei residential compounds' spatial forms based on three phases: 1. Socialistic planning economy era – 1950s to 1992; 2. the beginning of market-oriented economy era – 1992 to 2002; and 3. rapid urbanization era – 2003 to present.

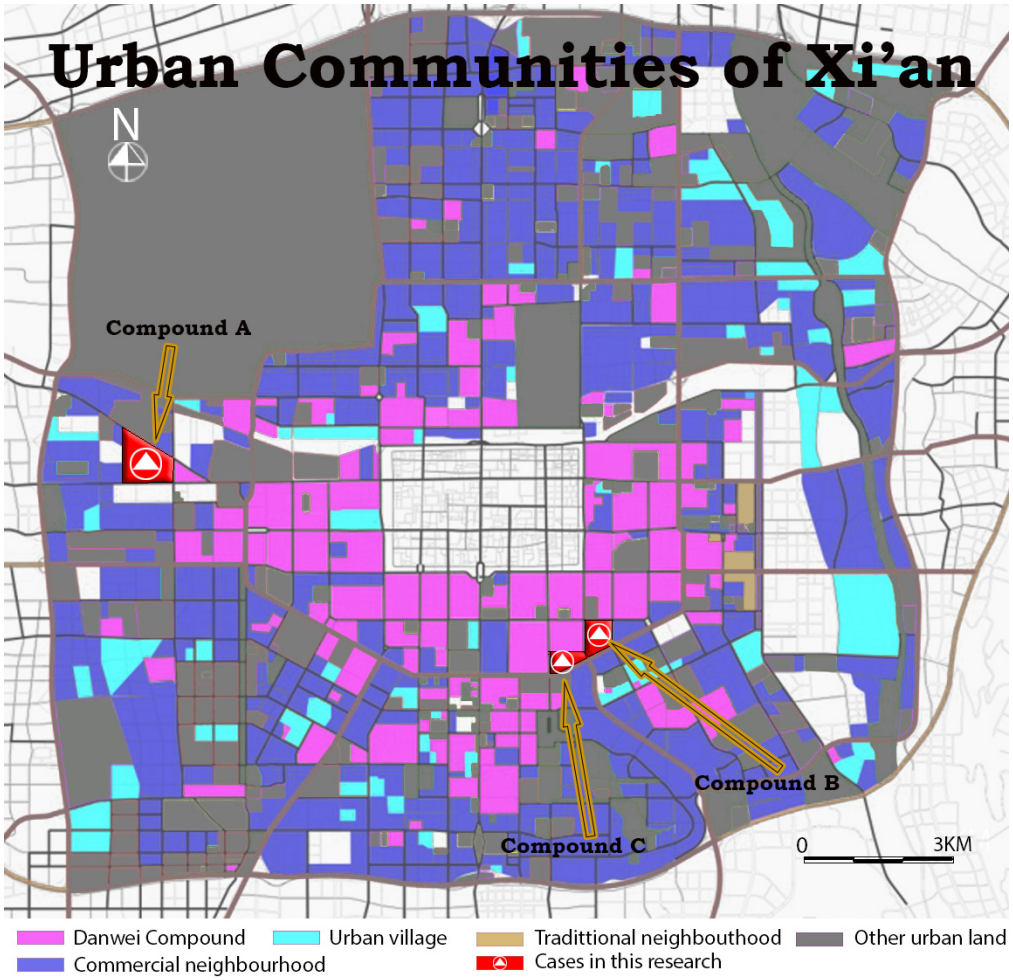

Fig. 1: The urban communities of Xi'an, China, showing the urban land patterns and the locations of the three cases studies in this paper. The Compound of Xi'an Metallurgical Plant (Compound A) is located at the west of the city while the Compound of Xi'an Railway Administration (Compound B) and the Compound of Xi'an University of Architecture & Technology (Compound C) are located southeast to the city center. (Source: Diagramed by the authors)

3. TYPOLOGIES OF DANWEI RESIDENTIAL COMPOUNDS

3.1. Spatial Features of Danwei Residential Compounds

During the period of China's planning economy (1950s-1990s), a Danwei (working-unit) was an essential element of urban social organization in cities across the whole nation. Through the combination of living and working, Danwei residential compounds have developed a unique urban community to promote collective livings through creating shared experiences occurred in shared places. In China, a Danwei residential compound is defined as an enclosed residential neighborhood with certain levels of supporting infrastructures and facilities built in the planning economy period to support more than 2,000 families. As the spatial carrier of the collective livings, Danwei residential compounds not only bring housing proximity to workplaces, but also support the basic needs of residents' everyday lives with their communal infrastructures, amenities, and facilities. Hence, the differences among various Danwei residential compounds mainly lie in the differences of the quality, number, and scale of their communal infrastructures and facilities as well as the degree of well-being services they provide.

Influenced by the planning and design principles and strategies during the planning economy era, all the three compounds studied in this paper exhibit the following spatial characteristics:

- Compared to other urban lands, Danwei residential compounds provide a unique spatial combination of residential facilities, retail accommodations, and living facilities within one place. Inside each case studied by this paper, all lands are classified into three uses: residence – including various kinds of low-, middle-, and high-rise residential buildings; retail facilities – including different dinning halls, restaurants, grocery stores, commercial /retail shops, and marketplaces; and living facilities – including schools, daycares, cinemas, theaters, clinics, sports courts/fields, and libraries.
- Middle- or high-rise housing units arranged in rows or clusters: this indicates a strong need to accommodate large numbers of workers /employees within limited available urban land for residential purposes. Compound A mainly contains low-rise and middle-rise apartment buildings while Compound B and C have more high-rise apartment buildings, many of which were built in later years to replace the low- or middle-rise residences for increased resident sizes.
- Various types of communal spaces and facilities are located within each compound. Each of the three compounds has provided full-scale communal facilities to support the residents' needs in education, healthcare, shopping, entertainment, and recreation. However, planning and organization of communal spaces and facilities are heterogeneous among the three cases as there is no uniformity of what communal spaces or facilities should be offered. Each compound develops its own communal infrastructures based on its own needs, conditions, and contexts. For example, Compound C hosts a higher education institute,

whose sports and recreational facilities are shared by both its student populations and the compound residents (such as faculty and staff members and their families). As a result, Compound C does not particularly provide sports and recreational facilities for its residents.

- Public life and shared experience are highly promoted within each compound. The layouts of buildings normally create courtyards for communal gatherings and public uses. Green spaces are also intended to develop between buildings to facilitate public activities. Within a compound, private spaces have been limited to each apartment unit. As long as the residents move out of their apartment unit doors, they move in various types of public spaces which are always shared with others. Those facilities are primarily only accessed by the employees and their family members of the Danwei, which facilitates the accumulation of social interactions among compound residents and encourages a strong sense of internal community.
- In terms of function of the communal spaces and facilities, all three cases indicate that education and healthcare are the top two major functions offered by each compound, in which education and healthcare facilities such as schools, clinics, and hospitals occupy over 25% of the land.

3.2. Influential Factors on The Spatial Forms of Danwei Residential Compounds

This paper considers three main factors attributed to the spatial forms of Danwei compounds: the proximity between employer's operation zone and residential zone, the size of employees and their families, and the employer's sector.

First, as mentioned above, each Danwei compound is a place of combining living and working. As a result, whether the employer's operational zone where working activities normally occur is spatially close to the residential zone where most employees and their families live profoundly influences the fundamental characteristics of spatial forms in a Danwei compound. For example, in Compound A, the residential zone is located far away from the manufacturing site. Consequently, Compound A possesses more transportation facilities that support the residents' commuting needs between homes and workplaces. In addition, it brings more challenges to upgrade and maintain compound infrastructures as it will cost more resources. Compound B and C have the employer's operation zones in a proximity with the residential zones, which makes it possible for both operational zones and residential zones to share some facilities but having fewer available lands for future growth.

Second, each compound's primary population is the employees and their family members. The size of that population directly determines the complexity of the operational and residential spaces and the compound's interactions with surrounding contexts. The larger a compound's population is, the more resources will be

needed from the surrounding urban contexts and the more complicated interfaces between the compound and surrounding contexts will be developed to support the compound's needs. Compound A and C have relatively smaller residential population so that they tend to rely on some facilities and infrastructure in surrounding streets while Compound C's large residential population forces it to develop more internal facilities and infrastructures.

Thirdly, the employer's sector is a significant factor determining spatial quality of each compound. Depending on its functioning and service natures, each employer has different priorities and preferences on its compound's site choice, spatial layouts, and interface with outside streets. In addition, each employer's financial performance also influences the upgrades and maintenance of spatial quality inside each compound. A well-performed employer is capable of not only maintaining the close linkage between operational and residential zones and consistently upgrading communal spaces and facilities according to emerging needs of its residents, as reflected on Compound B and C. On the other hand, a poor-performed employer (like Compound A) has trouble in maintaining the communal spaces and facilities, which has made compound residents rely more on the outside facilities and infrastructures for their everyday life needs. This further deteriorates the poor quality of the compound's communal spaces and facilities.

4. TRANSFORMATIONS OF COMPOUND LIFE AND SPATIAL FORMS

4.1. Compound Life Changes

The spatial forms of Danwei residential compounds have experienced significant transformations over times, particularly after the 1990s when China transitioned from a socialist planned economy to a more market-oriented society. During the socialistic planning economy era (1950s -1990s), employees and their families were the primary residents of each Danwei compound. The proximity between homes and workplaces and the homogenous demographics of community members within a Danwei created an inward urban life that seldom relied upon infrastructures and resources outside of the Danwei compound. In this way, China's urban residents acquired affordable and easy access to major benefits such as housing, healthcare, education, shopping and entertainment in the cities when urban resources were relatively scarce in urban China. In the meantime, each city also had less burden to develop its own infrastructures and facilities to accommodate the growing urban population.

However, the shift from planning economy to market-oriented economy has brought profound changes to the lives of Danwei compound residents. First, the proximity of employer's operational zone and the residential zone has experienced a major change due to the changing socioeconomic contexts. For Compound A, the employer, Xi'an Metallurgical Plant, lost subsidized support from the government in the

1990s, which resulted in massive layoffs and the suspension of maintenance of communal facilities within the compound. Many residents had to seek employment outside of the compound, which increased the physical distance between homes and workplaces. When external employments gradually helped the residents' financial situations over time and the compound's spatial conditions failed to be improved, many residents decided to move out for better housing and regaining the proximity of their new workplaces and new homes. After the original residents moved out, new residents, most of whom were newly arrived rural-to-urban migrants, purchased or rented apartments within Compound A to reestablish the proximity to their workplaces. The owner of Compound B, Xi'an Railway Administration, achieved a successful transition and secured sufficient financial resources under the changing contexts, which allowed it to be able to replace old apartment buildings with newly constructed high-rise residential towers. With the upgraded living environment, most employees continued to live inside the compound to enjoy proximity to their workplaces. Even when employees' families kept growing, many employees chose to purchase a second home in nearby neighborhoods to ensure them to continue enjoying proximity to their workplaces and communal infrastructures and facilities within the compound. The fast-increasing resident population of Compound B prompted the development of communal infrastructure and facilities which started to hire employees from outside of the compound. With the arrival of those new employees, they also started to seek chances to purchase or rent homes inside the compound to enjoy the proximity to their workplaces and the communal facilities, which, in turn, changed the original demographics of residential population of the Compound B. Compound C, as a place for a higher education institute, exhibited a different pattern. Compared to Compound A and B, Compound C possessed more high-quality communal infrastructures and facilities, such as its elementary school, secondary school and recreational facilities, attracting potential and existing residents. Since the early 2000s, many old apartment buildings within Compound C have been replaced by high-rise residential towers to accommodate some new employees and their families. Other new employees who do not gain the access to the apartment units inside Compound C normally purchase or rent homes in nearby neighborhood to ensure the proximity to their workplaces and their easy accesses to the communal infrastructure and facilities inside Compound C.

4.2. Transformation of Communal Infrastructures and Facilities

Communal infrastructures and facilities within each Danwei residential compound are important spatial means to promote collective livings and inward activities, reflecting the social and economic control during the socialistic planning economy era and the residents' everyday life needs during that time. When social and economic contexts change due to China's shift to market-oriented society, the role and functions of those communal infrastructures and facilities also undergo major redevelopments and renovations to support new needs of the compound residents, the Danwei and the city.

In Compound A, the maintenance of the communal infrastructure and facilities became suspended in 2000 due to the lack of financial support from the employer, which, in turn, deteriorated the quality of compound life. In order to reverse the disrepair of those infrastructures and facilities, the local government helped to launch some significant redevelopments to transfer the management of those infrastructures and facilities from the employer to outside venders and service providers and to commercialize the services by those transforming those infrastructures and facilities from non-profit to for-profit. With this shift, the compound schools become public schools accepting children from nearby urban communities while compound guest houses turn into hotels and compound recreational site convert into urban pocket park. In addition, some communal facilities, such as the Compound Bath House and the Kindergarten, have been demolished to provide land for other developments. In the meantime, the border that used to separate Compound A from surrounding urban contexts starts to disappear when all ground floor units of the residential buildings edged the compound have been repurposed into stores and shops along outside streets. With more and more outside urban elements brought in, Compound A gradually opens up to surrounding urban streets and the border between the compound and outside contexts starts to dissolve.

Communal infrastructures and facilities within Compound B exhibit a different direction of change. Since the employer gains considerable financial growth, the employee population keeps increasing and more resources can be invested in enhancing the compound offerings. 24 apartment buildings have been replaced by newly constructed high-rise residential towers and all residential buildings are well maintained in a timely manner. To accommodate the increased size of the resident population, new communal infrastructures, and facilities, such as a large-size grocery marketplace, retail stores, and public gathering facilities, have been added along the arterial compound roads. Underground parking lots have also been added as compound residents' car ownerships keep increasing. New expansions of existing communal infrastructures and facilities have developed to improve their capability of services. For example, the secondary school adds two academic buildings, and the elementary school adds one. The cafeteria is expanded to be a hub of restaurants and foods while the hospital adds a new high-rise inpatient tower. All those changes have further boosted the quality of compound life and, consequently, strengthened the collective living within the compound.

As a higher education institute compound, Compound C mainly deals with fast growing compound resident population caused by China's ambitious initiative of expanding college student enrollment since the early 2000s. 12 apartment buildings have been demolished to pave the way for constructing 8 high-rise residential towers to accommodate more employees. Due to limited available lands for further development, the upgrade of communal infrastructures and facilities heavily relies upon transforming the ground floor units of buildings along the compound edges to retail spaces and service spaces. However, this change softens the defined border separating the compound from the surrounding streets and outside influences are inevitably brought

into the compound, including non-compound residents. In the meantime, some communal infrastructures and facilities have been upgraded, expanded, and transformed into for-profit amenities. For example, the Compound Guest House is repurposed to be a hotel and the Compound Club House is turned into an art gallery.

4.3. Morphological Transformation of Compound Spaces

Since the 1990s, the spatial forms of Danwei residential compounds have been reshaped and redeveloped due to the changing socioeconomic contexts. There are many demolitions and redevelopments of residential buildings, reconfigurations of communal infrastructures and facilities, and renegotiations with surrounding contexts. Fig. 2 summarizes the morphological changes of the three compounds studied in this paper.

A clearly defined border is critical for a Danwei residential compound as the border provides a physical barrier to separate a compound from its surroundings for the creation of internal collective lives. In the meantime, borders are also the interface between the compound and the outside surroundings to create a linkage to allow controlled engagement to occur. As a result, a Danwei residential compound normally restricts the number of gates between the compound and the outside streets while using walls, structures, or buildings to enclose the compound. During the socialistic planned economy era (1950s -1992), Danwei residential compounds were enclosed by walls or buildings which could be only accessed from the inside of the compounds. The gates connecting the inside of the compounds with the outside urban streets were limited, which led to few opportunities of interaction between the inside and outside of the compounds. In each of the three cases, thousands of families living inside of the compound only relied on two or three gates to allow the movement of people, goods, and services between the compounds and the surrounding contexts. The borders of each compound were also well structured through the development of long walls and /or mid-rise residential buildings whose entrances were located inside of the compound.

However, since the planned economy was replaced by a market-oriented economy in 1992, the borders of all three compounds under this study have exhibited some levels of destruction. Retail and service stores replace enclosed walls and solid building facades, opening their doors towards the adjacent streets. In addition, more gates have been added to accommodate the growing needs of interactions between the inside and outside of compounds. Through transforming the borders, the physical barriers and security measures between the compounds and outside streets are demolished and active interactions cross the border start to develop. By doing so, spatial separations are changed into spatial connections. Consequently, all three compounds, in different degrees, become less distinct while more integrated into outside urban contexts. For example, in Compound A, transforming the compound's facilities and infrastructures to open to the entire urban district contributes to the removal of border, while the removal of border strengthens the transformation process

and makes the entire compound better engage with the surroundings. In addition, new commercialized housing projects have been developed inside Compound A, allowing outside residents to purchase, or rent homes in a place that used to be only accessed by the employees. The demographics of the compound residents have undergone a significant change, and the compound becomes more open to the outside urban contexts. Thus, little by little, Compound A becomes a part of the existing urban environment.

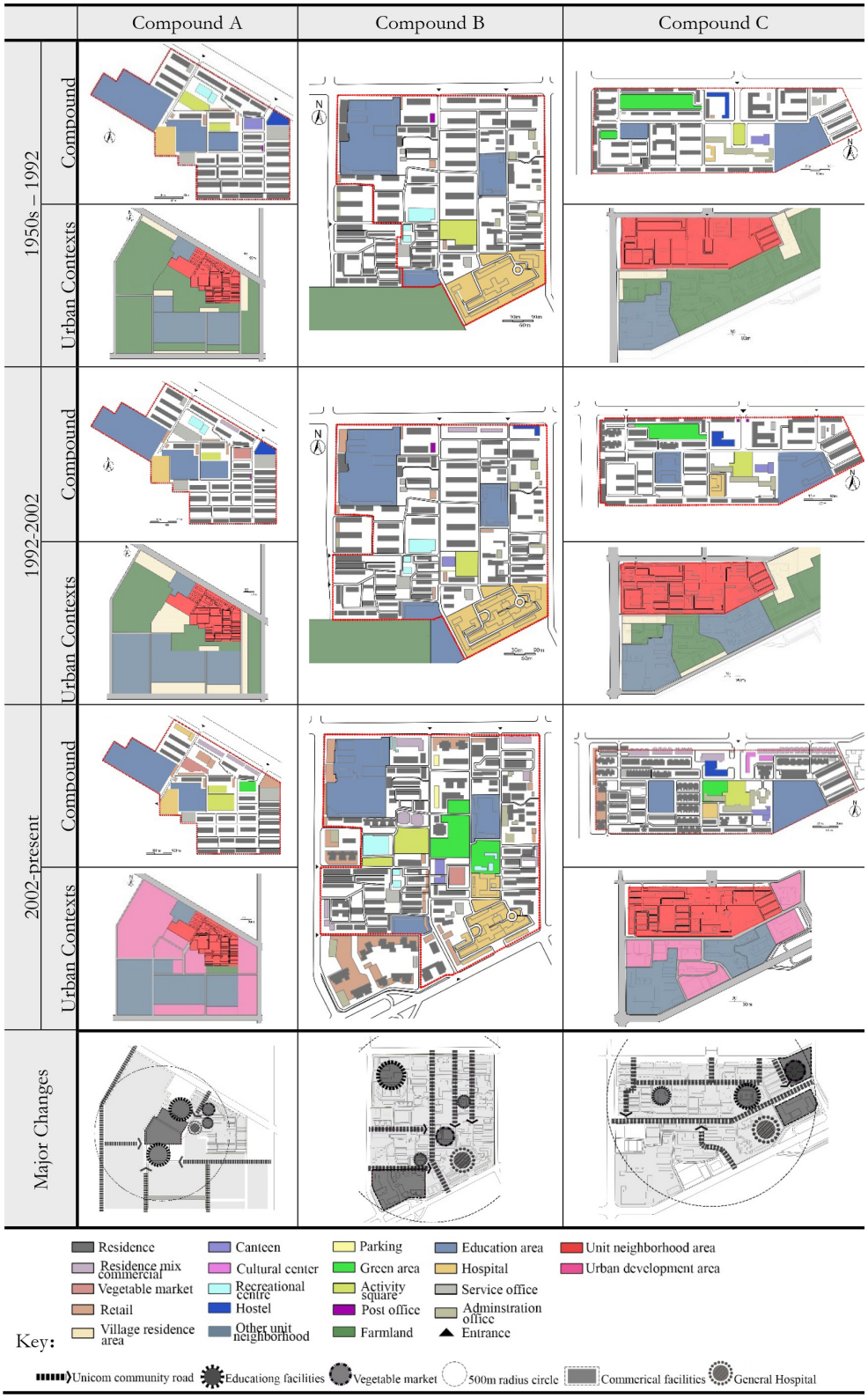

Fig. 2: The spatial transformation of the three compounds in Xi'an.

With a weakened border, Danwei compounds also gain a chance to grow and expand. Many residents of Compound B and C purchase or rent homes in adjacent neighborhoods as they prefer to enjoy better or more convenient housings outside of the compound while still taking advantage of the communal infrastructures and facilities inside the compound. To accommodate its increased resident population, Compound C works with local government to acquire adjacent urban lands to make more residential developments. Also, private developers and investors have been attracted to the border areas as they see the fast student population as great potential opportunities, which results in renovation and redevelopment along the border areas.

In terms of residential spaces, all three compounds become denser and more dynamic by demolishing outdated mid-rise housing units and developing modern high-rise apartment buildings. Due to the lack of support since the early 2000s, Compound A sees much less maintenance and redevelopment effort for its residential buildings. With the process of privatizing housings in China, original compound residents become able to sell or lease their homes, which leads to a shift of compound residents. The commercialized housing units built within the compound in recent years is developed by private developers who pay little attention to the whole compound's upgrades and improvements. In Compound B and C, fast growing employee populations and resident sizes are always a principal challenge to compound life quality. The main strategy used is to replace outdated mid-rise housing units with modern high-rise residential towers. Thus, both Compound B and C constantly build newer and taller residences to accommodate more compound residents and their families. Also, the ground floors of those high-rise housing units are normally designated for commercial or retail spaces to provide communal infrastructures and facilities for the everyday life needs of those growing residents, which diversifies the land uses within the compound.

Communal infrastructures and facilities have also undergone significant changes in recent years due to the efforts of privatizing and commercializing the services when China is moving towards to a market-oriented society. In all three compounds, the provision of communal services by the communal infrastructures and facilities indicates increased degrees of private managements and partnerships to improve service efficiency, operation, and offering. Compound A has the highest level of private control of communal infrastructures and facilities caused by the lack of the employer's contribution and support, which reflects the outcome of a dissolved compound. Compound B and C have conducted several rounds of upgrades for their communal infrastructures and facilities, mainly to accommodate their increased resident population. With the upgrades, those infrastructures and facilities become not only more privatized and commercialized but also more diversified for the amenities and services they offer, which contribute to the creation of more dynamic and vibrant compound lives. For example, both Compound B and C develop parking facilities in response to growing car ownership among their residents, along with new facilities such as fitness centers, sports facilities,

senior care centers, and marketplaces. Many of those infrastructures and facilities are also accessible by outside residents under certain conditions and restrictions, which reinforces the integration of both Compound B and C into the surroundings, encouraging local residents (both inside and outside of the compound) to enjoy amenities and services in proximity. Table 1 below summarizes the major changes of the three compounds from the socialistic planned economy era to today's fast urbanization era.

	Compound A	**Compound B**	**Compound C**
1950s -1992 **Socialistic Planned Economy Era**	Gate: 2 Border: Enclosed walls and buildings Residence: 31 mid-rise apartment buildings + 2 mid-rise studio buildings Education: 1 kindergarten, 1 elementary school, 1 secondary school	Gate: 3 Border: Enclosed walls and buildings Residence: 60 mid-rise apartment buildings + 8 mid-rise studio buildings Education: 1 kindergarten, 2 elementary school, 1 secondary school	Gate: 1 Border: Enclosed walls and buildings Residence: 44 mid-rise apartment buildings + 2 mid-rise studio buildings Education: 1 kindergarten, 1 elementary school, 1 secondary school
1992 -2002 **Beginning of Market-Oriented Economy Era**	Gate: 2 Border: Ground floor units of edged buildings transformed into retail /service stores Residence: no change Education: the high school shut down. Both elementary and middle schools were taken over by local government. The Club House was repurposed into a job training center.	Gate: 3 Border: Enclosed walls + newly constructed mixed use high-rise towers (retail stores at ground floor + residences above) Residence: 7 mid-rise apartment buildings were replaced by 3 high-rise retails + apartment buildings. Two mid-rise apartment buildings replaced by a parking garage. Education: the secondary school added two academic buildings. The elementary school added one academic building.	Gate: 2 Border: Enclosed walls and buildings Residence: 2 mid-rise apartment buildings were replaced by 1 high-rise apartment buildings Education: Both the elementary school and the secondary school added one academic building.
2003-present **Rapid Urbanization Era**	Gate: 3	Gate: 5	Gate: 4

	Border: retail /service stores. Border dissolved. Residence: Commercialized housing projects were developed inside the compound. Education: outside students were enrolled into the schools inside of the compound.	Border: enclosed walls + retail /service stores at the ground floor Residence: 17 mid-rise apartment buildings were replaced by high-rise apartment buildings. Education: the elementary school took more lands for its growth.	Border: enclosed walls + retail /service stores at the ground floor Residence: 10 mid-rise apartment buildings were replaced by high-rise apartment buildings. Education: more facilities were developed in both elementary and secondary schools.

Table 1: Major spatial changes within the three compounds studied by this paper during the three different phases from 1950s to present.

4.4. Everyday Life Behavior Transformation of Compound Residents

The morphological transformation of Danwei residential compounds profoundly reflects the changing lifestyle of residents and their everyday behaviors in the era of fast urbanization. When examining the compound residents' everyday behaviors, this paper focuses on three areas: 1) behavior of commuting between workplaces and homes, 2) behavior of meeting daily necessities and services, and 3) everyday life cycle.

First, compound residents' behaviors of commuting between their workplaces and homes have significantly changed. Before the 1990s, compound residents mainly relied upon walking or biking to commute between their workplaces and homes. Thus, workplaces' proximity to home was considerably critical for the quality of the residents' everyday life. However, compound residents' transportation choices have been much diversified due to the increased car ownership and improved public transits. Compound residents can afford longer distances between their workplaces and homes and the workplace's proximity to home is not a main consideration anymore. After the 1990s, all the three cases exhibit the decline of workplaces or operational spaces and the further development of residential and /or communal infrastructures and facilities. In Compound B and C, the increased car ownership, a significant change of residents' commuting mode between workplaces and homes, leads to the development of a new kind of communal facility, the parking garage. In addition, more public transit stops have been added around each compound, not only facilitating compound residents' commuting needs, but also strengthening the interaction between each compound and its surrounding urban contexts.

Second, compound residents' behaviors of meeting daily necessities and services demonstrate different patterns in the three compounds. In Compound A, the suspension of compound facility maintenance makes its residents rely more upon outside amenities and services for their everyday life needs. This creates an outward behavior pattern, shifted from the inward life in old times. With more residents going out to meet their daily needs, the compound border becomes inevitably meaningless, which contributes to the integration of Compound A into the city. In Compound B and C, the increased resident population not only results in constantly upgrading of their communal infrastructures and facilities, but also encourages private developers and outside vendors to further develop amenities and services along the border of the compounds to create more business opportunities to attract the fast-growing compound residents. This also leads to an outward behavior when compound residents see outside amenities and services are better than those inside. However, this outward behavior is balanced with the inward behavior which originally dominates the compound's collective life. Both Compound B and C still maintain communal infrastructures and facilities that offer high-standard and diverse amenities and services to compound residents' modern life needs. Many compound residents, including those who purchase or rent a second home in nearby neighborhoods, still prefer to use those amenities and services for their everyday lives. This expanded inward behavior combined with the outward behavior brings a more active interaction between the compounds and their immediate surroundings, which also contributes to a better integration of Compound B and C to the city.

Third, for most urban residents, the comfortable distance of their life cycles is around 500 meters, about 10 minutes walking. In old times, compound residents' life cycle has been primarily restricted within the compound since outside contexts fail to provide sufficient amenities and services. Since the 1990s, the decline of compound borders and more intensified interactions between the compound and its surroundings encourage compound residents to expand their everyday life cycles to the outside world. The sizes of Compound A and B have roughly the same size of 500 meters life cycle, which allows their compound residents to access to amenities and services at the edge of compounds and encourages the removal of compound borders to facilitate the integration of the compounds into the city. Compound C has a larger size, and it takes more than 500 meters to reach its edge. In addition, Compound C's communal infrastructures and facilities provide a good support for its residents' everyday life. Therefore, an inward behavior still dominates the residents' everyday life although they travel to the outside occasionally.

5. CONCLUSION

The study of the morphological transformation of three Danwei residential compounds indicate a unique process of urbanization in today's China. As a socialistic legacy from the second half of the 20th Century, Danwei residential compounds can be considered a modern "traditional" pattern of urban neighborhoods in

Chinese cities. The major shift of China's socioeconomic contexts inevitably brings profound impacts on this pattern. In spite of challenges and struggles, each compound has to identify its own way of transformation to respond to emerging needs and demands.

The spatial transformations of the three compounds exhibit a similar direction: to different extents, all of them, used to be enclosed and segregate from the city, are now open and gradually integrated into existing urban contexts. This integration is pushed by the change of compound residents' life patterns and their everyday behaviors, which can attribute to the changing socioeconomic contexts in China's cities. However, the integration of Danwei residential compounds does not lead to the death of those compounds. In fact, many compounds remain vibrant and active mainly through the upgrades of their residential and communal facilities. For a foreseeable future, Danwei residential compounds will still an essential component of today's cities in China. Their integrations into the surrounding urban contexts are creating a new pattern of urban community that is worthy of further studies.

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HOW DID PUBLIC RENTAL HOUSING CONTRIBUTE TO THE FAMILY LIVES OF CHINESE RURAL MIGRANTS? A CASE OF CHONGQING

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HOW DID PUBLIC RENTAL HOUSING CONTRIBUTE TO THE FAMILY LIVES OF CHINESE RURAL MIGRANTS? A CASE OF CHONGQING

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The 20th National Congress of the Communist Party of China has heralded a novel housing paradigm, advocating both ownership and rentals, specifically Public Rental Housing for rural migrants. While the impetus for this initiative stems predominantly from international experiences and the outcomes of subsidized home ownership, comprehensive empirical evidence on public rental housing's impact on rural migrants in China is scarce. Our research, anchored in Chongqing's public rental housing experience since 2011, delves into its tangible impacts—spanning economic opportunities, quality of life enhancements, family reunions, and intergenerational advancement through public education. We pinpoint affordable rent, enduring tenancy, open eligibility, and public-school access as pivotal policy facets driving public rental housing's success. These findings serve as invaluable insights for the national expansion of public rental housing.

1. INTRODUCTION

The Communist Party of China's 20th National Congress has called for the implementation of a new housing system that will offer rental and for-sale housing properties. In addition, China's 14th Five-Year Plan (2022-2027) emphasizes the importance of providing suitable housing for rural migrants and their families in order to integrate them into society. To achieve this, the Party Bureau and State Council have directed provincial and city-level governments to establish a local housing security system that includes Public Rental Housing (PRH), government-subsidized rental housing, and Housing with Shared Property rights. Since 2022, 40 major cities across China have initiated plans to provide a total of 6.5 million housing units under these schemes, which will benefit 13 million rural migrants and young people looking to settle in the cities.

The current national policy to promote PRH is largely based on foreign experience and the reflection of the subsidized housing scheme (*jingji shiyong fang*). However, there are still many unanswered questions about the impact of PRH on tenants' families in China. For instance, how can PRH improve the lives of rural migrants who were previously excluded from housing support schemes but are now included? Are current PRH schemes effective in integrating rural migrants into cities, expanding domestic expenditures, and promoting common prosperity for all?

Uncertainties regarding these questions can be detrimental to housing protection policy-making. Without fully understanding the societal impact of PRH and its implementation details, there is a risk of flawed replication. In the past, a large volume of subsidized housing properties was provided but failed to address the intended issue because such schemes were targeted at the wrong objectives. Thus, it is crucial to study the current tenants of PRH, their lived experiences, and family lives in PRH. By understanding the changes and meanings

PRH brings to their lives, we can gain a better perception of the scheme. Furthermore, such empirical inquiries can help narrow down effective implementation details for better targeting and practical design on PRH and other housing support schemes.

The provision of PRH and its inclusive policy in Chongqing is a unique case in China. Unlike other cities, Chongqing has constructed PRH on a large scale since 2011, providing about 420,000 units in metropolitan areas. This paper explores the life experiences of rural migrants who have moved into PRH for several years and shows the role of public housing in expanding their economic opportunities, promoting family reunions, improving life quality, and enhancing fertility and child-rearing quality. It also discusses the role of public education facilities in PRH communities in preventing the intergenerational transmission of poverty and strengthening the sense of security and happiness. The positive social effects of PRH are attributed to four policy details in implementation: low rent, stable tenancy, open eligibility, and public schools. Currently, 21 PRH communities have been completed, and the first batch of residents who moved into PRH in 2012 have been living there for ten years.

This paper contributes theoretically by providing empirical evidence on the practical effects of the Policy for Providing PRH. The paper highlights four policy elements in PRH that help rural migrants integrate into cities, achieve economic establishment, and improve their quality of family life. The policy implications of this paper suggest that other cities should consider using these policy tools when implementing the PRH strategy to attract the labor force and achieve common prosperity. Additionally, the central government should pay attention to the four policy details mentioned above when evaluating the local government's performance on PRH and ensuring the housing security of rural migrants.

2. LITERATURE REVIEW

Studies conducted in various fields have shown that PRH has numerous positive societal effects[1]. In this context, we focus on how PRH can contribute to the quality of life of tenants by providing economic security, improving expenditure, enhancing living standards, promoting family formation and fertility, and strengthening social cohesion.

Regarding economic opportunities, research suggests that housing stability facilitates the accumulation of human capital by saving time and money[2]. Scholars argue that this effect is due to the stability of occupancy and is not necessarily related to the status of property ownership. For low-income households or households without sufficient capital accumulation, such as rural migrants, high homeownership costs (heavy debt, for instance) can hamper their economic stability. In terms of daily household consumption, homeownership can either have a 'housing-slave effect' or a 'wealth effect.' On the one hand, families may reduce living

consumption due to the high cost of a home purchase. On the other hand, home-owning families may increase their living consumption when housing prices increase and asset values are appreciated. For families living in PRH, the low rent should theoretically increase their consumption and improve their daily life as more money can be spent on quality production and social life[3]. Furthermore, a vast and functioning housing rental market may encourage cross-regional migration as housing relocation becomes easy and less costly. Thus, a large volume of public housing provision should be helpful to labor force mobility, especially in an era where migrants seek better family lives rather than merely higher incomes[4].

International comparative studies have provided evidence that the structure of housing tenure has a significant impact on the family formation and fertility behavior of young people[5, 6]. It has been observed that countries with high homeownership rates generally have lower fertility rates. This is because young adults feel the need to own a home before getting married or having children, which can be expensive and challenging in the 21st-century[7]. In China, many young people choose to delay marriage due to the high cost and difficulty of owning a home. The homeownership policy and housing price fluctuations can have both positive and negative effects on marriage and childbirth[8]. As young couples are the ones primarily dealing with these decisions and are less likely to own a home outright, the dominance of owner-occupation and high housing prices can negatively impact them[9].

The housing tenure and conditions also affect the development of children born to young parents[10]. Stable occupancy and favorable living conditions have a positive influence on their academic performance. After controlling for variables from individual, family, community, and school aspects, it has been found that housing deprivation significantly correlates with children's math performance[11]. However, this effect can be reversed if the family has taken on high loans to acquire a stable home. Some researchers have suggested that the commodification of housing and the subsequent unbalanced development of public services have led to stratification in public spaces and widened educational inequalities, which in turn reproduce social class[12].

3. METHODOLOGY

The study was carried out in 3 PRH sites in Chongqing between 2018 and 2020, out of a total of 21 available for resettling. The chosen sites were Kangzhuang Meidi, Liangjiang Mingju, and Kangju Xicheng, which were the first batch of PRH sites in the city and were completed in 2012. The residents of these sites had lived there for a long time and had rich experiences. The study analyzed 120 in-depth conversations with rural migrants and applied a multi-stage stratified sample method to ensure that the participants had a strong understanding of their experiences. The eligibility criteria required that the participants be rural migrants who had lived in PRH sites in Chongqing for over a year, and only one participant per household was allowed. All interviewees used pseudonyms to protect their privacy.

The in-depth interviews were divided into three parts. In the first section, a structured interview was conducted to gather information about the interviewee's socio-economic background. The second part was a semi-structured discussion, where participants were asked about their reasons for moving to PRH sites. In the third section, open-ended questions were asked to follow up on emerging issues. Most of the interviews were conducted during non-working hours, such as on weekends and during the late afternoon or evening on weekdays. Relevant secondary documents and data were also collected from municipal authorities.

4. DATA ANALYSIS AND DISCUSSION

4.1. Socio-Economic Characteristics of Participants

Table 1 provides a detailed overview of the socio-economic and demographic characteristics of the participants. The study involved 120 participants, out of which 62 were male (52%) and 58 were female (48%). The majority of the participants (n=72, 60%) were under the age of 45. In terms of education, 85 participants (71%) had completed China's mandatory nine-year education system, while only 110 (92%) did not pursue higher education. The study revealed that 69 participants (57.5%) had a monthly income below 3,000 yuan, which is equivalent to about 475 USD. Only 18 respondents (15%) had a monthly income of more than 5,000 CNY, which is equivalent to about 792 USD. The findings suggest that almost 60% of the participants had low economic status and were at the bottom of the income ladder. This is in contrast to the average monthly income of people in Chongqing in 2019, which was around 8,020 CNY (equivalent to 1,268 USD)[13]. Additionally, the study found that 68 participants (57%) were originally from Chongqing, while 12 (10%) and 34 (28%) came from Guizhou and Sichuan provinces, respectively. Most of the respondents moved to PRH in Chongqing over a shorter distance, while eastern coastal cities usually attract rural migrants from all over the country with longer migration distances and higher mobility.

Living with family members is crucial for strengthening familial bonds, and it has a significant impact on these relationships[14]. In rapidly urbanizing areas, co-residence has become a natural expression of the importance of family relationships, particularly in China, where family togetherness has been highly valued for a long time[15]. According to a recent study, a large majority of the participants (n=100, 83%) lived with their families, while only a small minority (n=20, 17%) had an independent living status. Among the 100 participants living with their families, 23% (n=28) lived with their partners, 28% (n=34) lived with their parents or children (two-generation family), and 32% (n=38) lived with their parents and children (three-generation family).

The research findings demonstrate that the majority of the participants preferred a family-based approach to PRH and co-living with their families. This is in contrast to other affordable housing options, such as factory

dormitories[16], "villages in the city" in Shenzhen or Guangzhou[17, 18], and informal shared housing in Shanghai[19]. In these options, people have migrated alone to a new city and have adopted an individual-based approach to urban housing.

PRH in Chongqing allows families to live together without being separated, making it a truly family-based living mode. In this study, I have identified four distinct factors that contribute to the family-based approach and the family reproduction process. These factors are interconnected and interwoven, which ultimately affects the decision-making of rural migrants in adopting the family-based approach. With its unique characteristics, the PRH housing program in Chongqing is a pioneering initiative that stands out from other affordable housing options across the country. I will discuss these factors in the following sections to provide a better understanding of the program and its impact.

	TOTAL	PERCENTAGE
GENDER		
MALE	62	52%
FEMALE	58	48%
AGE		
18-30	30	25%
30-45	42	35%
45-60	25	21%
ABOVE 60	23	19%
PLACE OF ORIGIN		
CHONGQING	68	57%
SICHUAN (EXCEPT FOR CHONGQING)	34	28%
GUIZHOU	12	10%
OTHERS	6	5%
EDUCATION		
DID NOT FINISH PRIMARY SCHOOL	11	9%
PRIMARY SCHOOL	24	20%
JUNIOR HIGH SCHOOL	44	37%
HIGH SCHOOL	31	26%

COLLEGE AND ABOVE		10	8%
LIVING STATUS			
INDIVIDUAL-RELATED (SINGLE, DIVORCED, AND WIDOWED)		20	17%
FAMILY-RELATED	With partners only	28	23%
	Two-generation family	34	28%
	Three-generation family	38	32%
PERSONAL MONTHLY INCOME			
LESS THAN 3000		69	57.5%
3000-5000		31	27.5%
MORE THAN 5000		18	15%

Table 1: Socio-demographic Characteristics of Participants

4.2. Affordable PRH Rent

The low rental cost is one of the most significant reasons for the popularity of PRH. It eases the financial burden on low-income households and draws them towards it. The monthly rental rate for PRH in Chongqing ranges from 8 to 11 CNY per square meter, depending on the exact location of the PRH. According to the current policy, the PRH rental rate is revised every two years and cannot exceed 60% of the market value of commercial housing that has a similar quality and location. However, in practice, the rental rate for PRH has not increased since the first group of residents moved in October 2011. In contrast, the average price of private housing in Chongqing has almost doubled from 6,445 CNY per square meter in 2012 to 12,742 CNY per square meter in 2022[20, 21]. As a result, the rental rate for PRH has become even more affordable for rural migrant families than it was in 2011. Mr. Lin, one of the respondents, stated that the low rental cost of PRH encouraged his family to move and avoid separation.

> "I have a low income, around 4000 CNY (equivalent to 632 USD). Renting a two-bedroom flat in a private estate in the city center can cost around 2000 CNY per month. However, my monthly rent in PRH is only about 500 CNY (equivalent to 79 USD), which is only a quarter of the cost of renting a private apartment. This means that I can either live in a small studio in the city center by myself, or I can bring my family to PRH."
>
> Interviewee No. 51, 5 May 2018, Kangzhuang Meidi

Mr. Lin, like many others in the area, struggled to find a spacious apartment in the central urban location of Chongqing that he could afford on his income as an informant. As a result, he made the decision to move to PRH, which was a more feasible and practical option for him. Table 2 shows that 26% of the 120 participants also moved to PRH due to the low cost of rent. They believed that PRH not only provided ample space for

their families, but also allowed them to save money on rent, which could be utilized for other family expenses. Ms. Xie, who had received higher education, also moved to PRH with her three-generation family for the same reason. She recognized the value of investing in her children's education and found that the affordable rent at PRH enabled her to do so.

> "All this money saved from the low rent can be used to improve the conditions of the household, such as having a second child, sending the child to preschool, a family dinner out, or a country trip over weekends."
>
> Interviewee No. 58, 9 May 2018, Kangju Xicheng

It has been observed that rural migrants in China's coastal cities prioritize food and material consumption when sending their remittances, unlike the PRH respondents who spend their earnings on non-financial activities[22, 23]. These activities include sending their children to preschool, attending family dinners, and investing in family reproduction, such as children's education and having another child. During a conversation, Ms. Xie, who moved to PRH with her three-generation family (her mother, husband, and five-year-old child), emphasized the importance of these investments.

> "My child is about to start elementary school, and I'm planning to enroll him in preschool next year ... I also plan to have another child in the next year or so when the family is financially comfortable … Isn't making the next generation better off the reason we moved to Chongqing PRH?"
>
> interviewee No. 58, 9 May 2018, Kangju Xicheng

The affordable rents of PRH not only ease the financial burden of rural migrants but also enhance family planning, leading to improved material and non-material welfare of future generations.

4.3. A Relaxation of Eligible Criteria

Compared to PRH programs in other pilot cities in China, the PRH program in Chongqing does not have any regional or hukou restrictions on applicants. Critics of China's PRH programs often argue that the policy is not inclusive enough[24, 25]. For instance, in Shanghai, where obtaining an urban hukou is challenging, individuals with rural hukou are not eligible to apply for PRH. In cities like Shenzhen, where acquiring an urban hukou is easier, millions of people still have to wait for years to get into PRH. However, the PRH program in Chongqing is the only program that has a greater universal applicability. All applicants can apply for PRH, irrespective of whether they are local rural migrants or rural migrants from other provinces, as long as they have a secure stream of income in urban areas in Chongqing. In other words, applicants for PRH in Chongqing are not subjected to regional or hukou restrictions and only need to have a stable job and income in the urban area. This makes it accessible to everyone working in Chongqing, including migrants without local hukou.

Furthermore, income restrictions for eligible candidates have been increasingly relaxed over time. Initially, only single individuals earning less than 2000 CNY per month or couples with a monthly income of less than 3000 CNY were qualified to apply for accommodations in PRH. However, over time, the eligibility criteria expanded to include single persons earning less than 3000 CNY per month, couples earning less than 4000 CNY per month, and households consisting of more than two persons with an average monthly income of less than 2000 CNY per capita. By 2019, there were no income restrictions in place, but all applicants still had to prove that they had a steady stream of jobs and income. This low eligibility threshold has attracted numerous rural migrants to PRH in Chongqing, particularly families who lack local urban hukou but wish to lead a comfortable family life in the city. Ms. Wang, a respondent from a two-generation family in PRH, met her husband while working in Dongguan, a city in southeast China. The family moved to Chongqing PRH in 2014 since they found it easy to obtain a spacious flat in PRH, which they believed would be more suitable for their children's growth.

> "In Dongguan, we were married, but my husband and I had to live in different dormitories according to gender. Later, we moved to an urban village when we had a child. Still, the flat there was too small to raise a child and have a good family life despite its central location … PRH in Chongqing is the most accessible and feasible solution as we were seeking a comfortable and stable family life."
>
> Interviewee No. 9, 2 February 2018, Kangzhuang Meidi

The case of Ms. Wang highlights how dormitory-style accommodation in factories and urban villages is inadequate for family-oriented housing. These types of housing often result in the forced separation of families or overcrowding. On the other hand, Chongqing PRH has more relaxed eligibility criteria and policies, which has enabled more family-based accommodation options, making it a better choice for migrant households seeking to establish a family life[26].

Chongqing municipality has established a more inclusive PRH policy compared to other Chinese cities. This is due to the massive supply of PRH available in Chongqing. In fact, it is currently the largest provider of PRH among all cities in China. The plan is to construct over 692,000 flat units covering a total of more than 40 million square meters across metropolitan Chongqing between 2010 and 2020. In 2012 alone, the municipality constructed over 140,000 flat units, which was thirteen times more than Beijing. By 2020, over 540,000 PRH flats had been allocated in Chongqing, solving the housing problems of over 1.4 million people and increasing the affordable housing coverage rate to 23% for urban residents. Despite having a smaller urban population than Shanghai, Chongqing's PRH provision is more than three times that of Shanghai. Therefore, Chongqing authorities can lower the eligibility threshold and enhance the inclusiveness of the PRH program. However, if China's eastern cities with generally low PRH supply establish an inclusive policy

by relaxing eligibility criteria, it will lead to millions of eligible candidates competing for limited supply, resulting in a long waiting time for new applicants.

> "We had contemplated applying for a PRH unit in Dongguan City, but it seemed almost impossible. Several of my acquaintances had been waiting for a PRH flat for five or six years without success. At that time, we were in dire need of a home and couldn't afford to wait that long. Hence, we decided to apply for Chongqing PRH and were fortunate enough to be assigned a flat on our first attempt."
>
> Interviewee No. 9, 2 February 2018, Kangzhuang Meidi

The results indicate that lowering the eligibility criteria has made affordable housing more accessible and family-friendly for rural migrant families in Chongqing's PRH.

4.4. Stable PRH Provision

Many rural families who have migrated to urban areas are motivated to settle in PRH due to its low cost and stable provision. According to empirical research, the most popular reason for moving to PRH is the stable supply of housing, with 37.5% of respondents citing this as their reason for choosing PRH. The construction of 40 million square meters of PRH has not only lowered the eligibility threshold but also stabilized the supply of housing. Current rules state that PRH tenants who have purchased commercial housing must give up their PRH flats. This means that residents can theoretically live there for life as long as they do not own any other property in the city[17, 27]. Migrant families living in PRH do not suffer from forced separations or the risk of eviction by landlords, unlike those living in urban villages or informal housing. Mr. Lin, who moved to PRH due to the low rent, explained how the stable PRH provision further encouraged his family to resettle and avoid forced family separation.

> "The current policy is that residents can live in PRH as long as they want. Thus, we never need to worry about being kicked out of the flats and forced to separate from our families."
>
> Interviewee No. 51, 5 May 2018, Kangzhuang Meidi

PRH offers a high level of stability to rural migrant families, making them feel secure and consider it a long-term solution for their family housing needs. They no longer have to worry about landlords evicting them or the government demolishing their illegal buildings. This helps promote family togetherness, which is highly valued in Chinese society. In addition to providing migrant families with a physical space and basic amenities, PRH also ensures a stable and reliable living arrangement.

	INDIVIDUAL-RELATED RESPONDENTS (N=20)	FAMILY-RELATED RESPONDENTS (N=100)	TOTAL (N=120)	PERCENTAGE
WHY DID YOU MOVE TO PRH?				
STABILITY OF PRH PROVISION	3	42	45	37.5%
CHEAP RENT	5	26	31	26%
SCHOOLING IN PRH	0	26	26	21.5%
GOOD BUSINESS OPPORTUNITIES	4	3	7	6%
HAVING FELLOW VILLAGERS OR FRIENDS LIVING IN PRH	5	0	5	4%
CLOSE TO WORKPLACE	2	1	3	2.5%
OTHER	1	2	3	2.5%

Table 2: Participants' Reasons for Moving into PRH (n=120)

Moreover, providing PRH to families offers a stable living environment, enabling them to concentrate on their jobs and earn more income. According to Williamson[28], people's allocation of resources in organizations is influenced by various contract structures. He argues that individuals with stable housing tend to have better job security, improved job contracts, and lower transaction costs for job-organization contracts. In other words, people with stable housing have more time and energy to work, which helps them earn more money. On the other hand, unstable housing leads to people spending more time dealing with housing-related matters and can result in job insecurity, making it difficult for people to increase their income and build human capital. The results of our study support this conclusion. Mr. Wang, a construction worker in his early 50s who lives in Kangju Xicheng PRH with his remarried wife and two children, explained this situation.

> "Our places were demolished, or the rent increased, which caused us to have multiple house moves in the past ten years ... The hassles of moving to a new house multiple times also left us mentally exhausted … As a result, my wife and I could not focus on our family and work simultaneously. We had to send the children back to our rural home until we found a new foothold in the city."
>
> Interviewee No. 24, 12 February 2018, Kangju Xicheng

The present research suggests that improved housing security can positively impact the decision-making of rural migrant families in terms of employment and setting up small businesses. This, in turn, can lead to better job opportunities and financial stability, allowing families to provide better for their own. Our findings also

revealed that only a small percentage (6%, n=7) of respondents believed that PRH offered good business opportunities.

During our field research, we discovered a new trend among migrant families. Families who have accumulated enough economic capital are now buying private housing units near PRH. They usually register these units under their parents' names to maintain their legal right to live in PRH. Respondents mentioned that while they and their children lived in PRH, their elderly parents lived in private estates nearby. During weekdays, the respondents go to work while their elders come over to take care of the children and do housework. For example, Ms. Pang and her family lived in PRH for seven years. When her parents got old, she decided to buy an apartment in a private estate near the PRH neighborhood and settle her parents there. She explained that this decision was made to take better care of her parents.

> "We have lived here for many years and have been very well adapted to PRH, and we knew we would live here for another long period. Thus, we decided to buy a flat nearby and bring my parents over ... My parents come over every morning to help us take care of the child, cook, and clean when we go to work ... we financially contribute to the family, while they non-economically share the family responsibilities."
>
> Interviewee No. 14, 11 May 2020, Liangjiang Mingju

The case study highlights the different methods used by households to reproduce their family. Each family member contributes differently to the process, either by working, buying a flat, or doing house chores. Previous studies on Chongqing PRH have found that the stability of housing plays a crucial role in the decision-making process of rural migrant families[26]. This case study further supports this finding by demonstrating that the stable provision of PRH facilitates the process of family reproduction in rural migrant households.

4.5. The Priority in School Enrolment for Children

Having stable housing not only supports a family-oriented lifestyle but also contributes to improving the education level of children living in such homes. Research has shown that building social housing in Europe and the United States during the 1960s and 1970s provided a stable living environment for low-income families, enabling their children to receive better education. This has resulted in overall improvement in education levels across the countries, leading to enhanced economic and social development[29, 30].

Chongqing PRH is unique in its approach to prioritizing the enrollment of affiliate schools for rural migrant families. These families usually have children who are ineligible to study in public schools in Chinese cities. Chongqing PRH program provides primary schools that are open to children of rural migrant residents, which is not available in any other PRH in Chinese cities. Some Chinese cities, such as Shanghai, have strict

regulations regarding school enrollment. Children who want to study in these cities must have a local urban hukou or residence permit to enroll in the city's schools. On the other hand, in some cities, such as Nanchang and Changsha, children of rural migrants in PRH can go to urban schools, but they still have to compete with children from urban backgrounds for educational opportunities.

In contrast, children of rural migrants in PRH in Chongqing are given priority to attend PRH-affiliated schools, regardless of whether they have rural or urban hukou. As a result, many rural migrant families have moved to PRH. The survey results confirmed that around 21.5% of the respondents (n=26) moved to PRH because their children could attend schooling there (see Table 2). For instance, Ms. Zhong, a 35-year-old rural migrant who resettled to Liangjiang Mingju PRH with her three-generation family (parents-in-law, husband, and daughter) in 2015, is one of them.

> "My child would not have had the opportunity to attend any good urban schools due to the poor quality of education provided in our rural area. However, thanks to the offer made by PRH, my family and I were given the chance to relocate to this area and provide our child with a better education. Therefore, we accepted the offer and are grateful for the opportunity."
>
> Interviewee No. 60, 11 May 2018, Liangjiang Mingju

Enrolling in schools affiliated with PRH can be beneficial for rural migrant households in terms of family reproduction. All PRH-affiliated schools are essentially public schools located in urban areas. Since they are public institutions, their tuition fees are significantly lower, and the quality of education is relatively better than that of private schools in urban areas[31]. Therefore, the children of rural migrants can receive a quality education in PRH schools while their families can save a considerable amount of money on education-related expenses. The saved capital can then be used for family reproduction, such as enrolling children in extracurricular activities. Ms. Zhang, a 37-year-old mother, has a positive opinion about schooling in PRH. She shared her thoughts, explaining the impact of schooling on her family in detail.

> "In the city, private schools can be too expensive for some families, and the quality of teaching can be unpredictable. On the other hand, PRH-affiliated schools are public and offer equal access to teaching staff and resources. As a result, the quality of education is guaranteed, and the tuition fees are almost free. This leaves families with more money to spend on preschool or extracurricular activities, such as English classes."
>
> Interviewee No. 81, 16 June 2018, Kangju Xicheng

Rural migrant households not only invest in their children's education, but also participate in other family activities, such as buying new clothes and going out for family dinners and weekend trips. However, according to some respondents, investing in education is the most significant and meaningful activity among all the family reproduction processes. Ms. Zhang also added her perspective on the topic.

> "We moved to the city to secure a better future for our child. Rather than just giving her money, we believe that it's important to provide her with a good education and teach her how to earn a living. This way, she can build the future she desires. These skills and educational achievements can be passed down to future generations, which is not possible with material consumption."
>
> Interviewee No. 81, 16 June 2018, Kangju Xicheng

The individual who was interviewed expressed their belief that education becomes increasingly valuable with time. Furthermore, the investment made in education to promote family growth can be passed down through generations, distinguishing it from other forms of consumption. This is why education has had a significant impact on both family planning and reproductive health in PRH. By relocating to PRH and enrolling in its affiliated schools, migrant families can offer better opportunities for future generations.

5. CONCLUSION

The 20th National Congress of the Chinese Communist Party has proposed a new housing system that includes both rental and owned properties, with various supply options and protection channels. The State Council's 14th Five-Year Plan has mandated provincial and city-level governments to improve the supply of PRH and other subsidized rental and owner-occupied homes, leading to construction projects in many major cities. This paper presents empirical studies on three pioneering PRH projects in Chongqing and summarizes four essential policy characteristics for the success of PRH. The paper recommends that local governments should consider these four policy details, which promote inclusion and common prosperity for migrants while implementing PRH schemes. The paper also suggests that the central government should take these four aspects into account while evaluating local governments' performance in PRH provision and social integration.

The first policy aspect is a reasonably low level of rent. According to the paper, rent that is higher than one-third of disposable income harms the quality of family life. The empirical study found that when rent was limited to roughly one-sixth of one's disposable income, households had sufficient budgets to spend on daily life and developing social relations. They could also save for marriage, child-rearing, and acquiring assets. The paper suggests that the development costs should not be thrown on the tenants or reduced to minimum survival. Strict regulation of the rent of PRH and sufficient expenditure budget are crucial for migrant families to integrate into urban life. This is conducive to the long-term prosperity of the local economy.

The second aspect is the unlimited or relatively long duration of the tenancy. There are severe discussions about the suitable duration of PRH tenancy in China. Some scholars and practitioners argued for a relatively short-term tenancy duration to effectively use the property and push the tenants to buy. However, based on

the case of Chongqing, the benefit of the long duration of the tenancy is substantial. It can strengthen the tenants' expectations of future housing stability and housing costs. This increases their willingness to make long-term commitments in childbirth and entrepreneurship.

The third aspect is open eligibility. PRH application in Chongqing has no means-test or Hukou restrictions and only asks for six months of local income and social security participation. In fact, some median-income migrant talents would also choose PRH as a transition. One benefit of open eligibility is to attract the young labor force and encourage them to settle down with families. This can benefit the city's economic prosperity and social sustainability because these newly settled citizens would expand their consumption in other aspects as housing costs were reduced. In this way, their life quality is improved, and their intention in fertility is strengthened.

Lastly, all PRH projects should be accompanied by qualified public elementary or secondary schools. The paper highlights that one of the most critical considerations in migrant families' settlement decisions is their children's education opportunities. Through the provision of qualified public schools, the economic burden of children's education is eased. This allows migrant families to spend more in other spheres and increases their possibility of having more children. Meanwhile, the next generation of newly settled migrant families can obtain higher education and integrate better into urban cultural life. This integration process is crucial in strengthening social mobility and class harmony.

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Traditional Dwellings and Settlements

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BETWEEN TRADITIONAL AND CONTEMPORARY ARCHITECTURE – UNDERSTANDING THE NEW TYPOLOGY OF ASSAM'S ARCHITECTURE

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BETWEEN TRADITIONAL AND CONTEMPORARY ARCHITECTURE – UNDERSTANDING THE NEW TYPOLOGY OF ASSAM'S ARCHITECTURE

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Traditional architecture, is as important for our built environment as contemporary architecture. Both have their own significant characteristics and values.

Assam, one of India's north-eastern states, is noted for its distinctive traditional architecture, which is deeply connected to the local culture and climate. However, with rapid urbanisation and increased global exposure, the transformation in the built environment has led to the emergence of a hybrid typology of architecture which is confusingly identified as traditional by some and contemporary by others.

It is important to acknowledge that tradition is a dynamic process and it often needs to be reinterpreted to keep up with present human needs and situations. But it is also equally important that these changes take place while retaining the crucial values and lessons of the past.

Thus, this paper is an attempt to understand whether the 'hybrid' typology which is being regularly constructed in Assam today, is a true reinterpretation of Assam's traditional architecture. This has been achieved by identifying the unique determining features of the predominant traditional typology of the region, followed by comprehensive case studies from different locations in Assam which are undergoing similar shifts in their built environment. Subsequently, a comparative study and analysis of the traditional typology and its' contemporary counterpart has been conducted, taking into consideration the identified features. Expert's opinion as well as user's perception has also been considered to support the study.

1. INTRODUCTION

Traditional architecture is the result of thousands of years of knowledge and tradition accumulated throughout time, and it reflects the physical and sociological features of the environment it is a part of. This is an indigenous form of architecture that displays the character of multiple and unknown local contributors and openly reflects the traditions, culture, experience, and customs of the people it serves.It is one of the most fascinating branches of architecture for various reasons, but most interesting perhaps are the rapid changes taking place in this field.

Traditional architecture changes because, it is not just an individual entity; it always has a particular relationship with the surrounding, as the surrounding environment is also the source of life for all those living there [1].

There is no denying that globalisation has emerged as a profoundly influential factor for the changes in the built environment and most traditional built environments of the world including those in India, has been experiencing it. The region in question today, Assam, one of the North-Eastern states of India, is no different.

The traditional architecture of Assam is usually identified by the use of locally accessible and natural materials like bamboo, wood and mud. The use of these materials and wise design strategies not only made the traditional buildings sustainable, but also showed great respect for the microclimate. A very popular and ubiquitous traditional typology which emerged during the British colonization in Assam, commonly known as the 'Assam-Type House', also use materials like baked bricks, CGI (Corrugated Galvanised Iron) sheets and glass in addition to the natural materials.

Assam has been a vulnerable region with heavy rainfalls and violent earthquakes and the traditional architecture is particularly responsive to such natural calamities. For instance, all traditional buildings have sloping roofs and are usually built on a raised plinth which helps in mitigating the effects of heavy rainfall. Similarly, traditional constructions also use lightweight materials like bamboo and Ikra (a local reed) for its walls; this light weight wall system imparts lightness to the overall structure, which has been found to perform very well during earthquakes.

Notably, the rapid transformation of the built environment in the past decade imply a significant shift from traditional architectural norms, and yet retains certain commonalities.

There seems to be a conflict between the desire to be called 'modern' and to keep up with the trends and at the same time, the tendency to hold on to one's tradition. This conflict, has led to the conscious or subconscious invention of a hybrid typology of architecture, which is also identified locally as 'Assam-Type.' This contemporary Assam-type building, many a times merely mimics the form of the traditional Assam-type, but fails to achieve other aspects which has been crucial in the traditional Assam-Type designs.

It is therefore essential to differentiate between the rational components within the reinterpretations of tradition from those which are not, particularly in a function driven subject such as architecture and that is what I plan to explore in this paper. However, my intention is not to glorify one and condemn the other, but to comprehensively grasp the different perspectives including that of experts as well as the users of these buildings.

2. INTRODUCTION TO THE REGION

Assam is characterized by plains, hills, and river valleys. It covers an area of approximately 78, 523 sq. kilometres and its most important landmass are the plains of Barak and the Brahmaputra Valley. It's varied geographical attributes and particularly the presence of the Brahmaputra River, have rendered the region not only extremely fertile but also abundant in natural resources. This contributes to its agricultural prosperity and provides the natural materials like wood and bamboo, needed for sustainable constructions. Most of the year,

Assam has a tropical monsoon rain forest climate, which is characterized by high humidity and a lot of rainfall. The plains have a sultry climate, while hilly regions have a sub-alpine climate [2].

The state of Assam has a long history of natural disasters. Along with floods and landslides, the state is also vulnerable to earthquakes. Located in one of the world's six seismically active regions, Assam has experienced two of the biggest earthquakes in Indian history: the Assam Earthquake of 1897 (M 8.7) and the Assam-Tibet Earthquake of 1950 (M 8.4)[2].

3. TRADITIONAL DWELLINGS IN ASSAM

Dwellings in Assam are categorised under two local terms , kutccha or Kesa and Pukka or Poka , where Pukka usually refers to the buildings constructed using cement mortar or RCC (reinforced cement concrete) constructions in general.

The traditional dwellings fall under kutccha/ kesa or Semi Pukka/poka category. Kutccha, refers to raw or uncooked; it is an adjective used for structures made of natural and locally available materials such as mud, bamboo, and thatch. Semi-pukka structures are made with a combination of organic and inorganic materials [2].

Thus, the common traditional dwellings in Assam can be identified under the following typologies –

Bamboo Dwellings (Baahor ghor): As the name suggests, bamboo is the primary material used for such constructions. These are smaller houses, usually in rural areas. The construction process of traditional bamboo dwellings is simple, where the bamboo culms are anchored into the ground, and the bamboo structural frame is erected. The plinth is usually made of rammed earth with mud plaster. The floor is finished with a mix (1:1 ratio) of mud and cow dung. The walls are made with woven bamboo and sometimes plastered with mud. The sloping roof is usually covered with thatch or ikra. Although, newer constructions use CGI sheets too.

These dwellings typically have three or four rooms and are rectangular in shape. With linear planning and rooms that open into one another, the plans and sizes vary according to requirements.

A common area for getting together or hosting guests is the drawing room, also known as the Sora Ghar. Depending on the number of family members, the Huwa Ghar, or bedroom, can be a divided area with partition walls [3]. The family's kitchen and dining area are combined in the Randhoni Ghar, or kitchen space, which is usually built away from the main living spaces. The bathing area and toilets are also located away from the main house, preferably closer to the source of water.

Stilted Dwellings (Chang ghar): The stilted kutccha houses or 'chang' is a typology seen in areas of high precipitation and moisture content both in the air and the soil. Construction is done mostly with bamboo or wood and thatch for roofs.

The stilted dwellings are generally rectangular in shape and are similar to the bamboo dwellings with linear planning and rooms opening into each other.

These are built on bamboo pillars, to which bamboo diagonal bracings are fastened to create the stilt. With the help of dowel and tenon joints and jute ropes tied across the bamboo posts, horizontal members form the structure above. Usually, the stilt height is between 1.50 and 2.00 meters above ground.

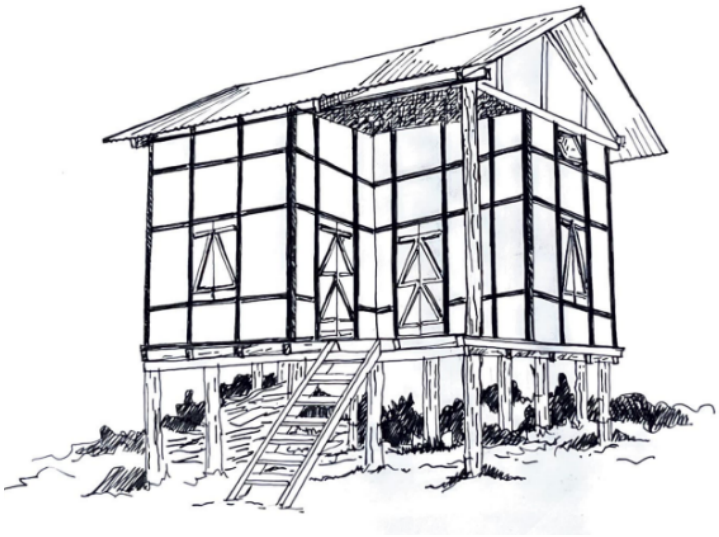


Figure 1 : Chang Ghar (Source : Farha Shermin and Mainak Ghosh , 2022)

A canoe is frequently kept in the area beneath the stilt for use in an emergency during floods. Typically, the stilted houses are built to withstand the effects of a strong monsoon. Most of the inlays on the walls and floors are made of bamboo, which lets floodwaters and heavy rains pass through instead of being retained. A local variety of hay or rice straws is spread over bamboo trusses that are fixed atop the posts to create the roofs of the houses. The roof is roughly 3.50 meters above the floor which is made with woven bamboo and wood. A bamboo loft is installed inside, below the roof, to store goods safely in the event of flooding. Heat conductivity of bamboo is poor, which helps to keep the interiors cool. Adequate ventilation through the permeable floors and wall keeps the moisture content inside the houses low [4].

A chang ghar is also sometimes constructed using the ikra type of construction. These are smaller ikra and wood houses raised on wooden stilts. In colder areas , the stilts are also used to house the cattle which in turn helps in keeping the interior warm.

Ikra Dwellings or Assam-Type houses – Ikra is a local reed , that grows in the marshy lands and loamy soils of Assam's river plains and surrounding lakes; these are extensively used in the walls and sometimes roof of this typology, popularly known as the 'Assam Type House'.

The thin yet robust skin of the Ikra shoot is shielded by a thick, siliceous sheath that covers the body of the shoot in between internodes. The Ikra shoot typically has a diameter of between 6 and 16 mm. Although it can grow up to a height of 3 to 4.5 m, 2.5 to 3.65 m is the practical height. The best use for mature Ikra shoots is for roofing or walling. Unlike bamboo, it is less vulnerable to insect attack. Ikra homes have good thermal insulation because of the air content in the hollow inner core of the reed, which makes a good thermal insulator. Ikra shoots adhere very well to cement, lime, or mud mortars [3]. This construction type has been in practice for more than 200 years. These houses are built on a raised plinth. Because of the elevated plinth, these houses are shielded from stray animals including reptiles and runoff from rainstorms.

Traditionally, Sal wood is used for the elevated floor, roof trusses, and vertical posts. The superstructure is basically a wooden framework, infilled with wall panels. The Ikra reed is used to fill into bamboo frames that are oriented vertically to form the wall panels which are then are plastered from both sides using a mud-dung mixture using the Wattle and Daub technique. The roof covering is a thick stack of ikra reed or thatch [3].

During the initial period of the British colonial rule in Assam (1826-1947), the buildings were built with timber walls and thatch along with some masonry buildings.

On June 12, 1897, a powerful earthquake struck the northern ridge of the Shillong plateau, destroying most of the British-built structures made of limestone and bricks, including those built with lath and plaster. This incident led to the appreciation of the traditional constructions methods and initiated an attempt to improvise the same. The new model was developed along with a team of Japanese seismologists [4]. In the following decades, the Assam-type of construction was improved, made popular and more systematic with the introduction of specifications, elaborate joinery details and some modern materials by the British. The improvements included the introduction of materials like baked brick, glass for window glazing, roofing sheets and also steel sections as a supporting member to the traditional construction method. Similar to traditional Japanese architecture, emphasis was placed on enhancing the wall's strength and quality. This was achieved by using braces in the walls and metal components to reinforce joints, as well as by placing multiple panels of bamboo and reed mesh inside a wood framework that was plastered with mud to facilitate insulation and render flexibility [5].

Figure 2: A double storey Ikra House at Hajo (Source : Photographed by Author)

Figure 3 : Traditional Assam-Type House (Source : Photographed by Author)

In these Assam-type constructions, the timber posts either embedded or bolted into a concrete base. The superstructure uses the same method for the framework with wood , which is infilled with the ikra-bamboo panels. Sometimes though, a brick wall is constructed up to the sill level from the plinth and the wood – bamboo – ikra wall is built above it as usual. Ikra is still widely used as it is susceptible to insect attacks. The walls are plastered with either mud or cement plaster. The connections between the wooden posts and intermediate wooden members are done by using nuts and bolts. The roof is pitched with a high gable to cater to the heavy rainfall in the region, and is covered with GI sheets fixed to wooden purlins with J-bolts[3]. The ceiling is made with wooden planks or woven bamboo mats supported by wooden members. Sometimes, the attic thus formed is also used for storage. The Sal wood doors and windows were now glazed.

The toilets and bathroom are located away from the main house and close to the source of water which could be a well or tube well; the kitchen is also built separately, usually separated by an open courtyard to avoid fire hazards since most of the materials used were organic and prone to catch fire easily. It was noted that the majority of houses survived the major earthquakes in 1897 (Assam earthquake, M 8.7) and 1950 (Assam Tibet earthquake, M 8.6)[2].

After India's independence, the successive governments appreciated the advantages of the light weight and sustainable construction of the Assam type houses and implemented the same for the construction of government offices, institutions, and residences [5,] many of which still exist and are in use. It is very interesting to note that the configuration of these buildings' changes with the change in function. Office buildings were usually built in double floors with larger windows for more natural light and ventilation, Assam-type churches had very different shapes for the doors, windows and roof . These buildings always has a back door to escape during emergency [4]. The use of locally available materials also makes these buildings comparatively low cost. It has been estimated that the cost of traditional Assam type houses is nearly half of that of a contemporary RCC building of the same size [2].

3. KEY ARCHITECTURAL CHARACTERISTICS OF THE TRADITIONAL ASSAM-TYPE DWELLINGS

Assam type houses exhibit distinctive architectural characteristics hat have been identified and analysed by experts in the field. These characteristics encompass the judicious selection of materials, construction methodology, spatial configuration, aesthetical features, and a strong emphasis on sustainability, all of which contribute to the unique identity of these traditional dwellings.

1. Materials : Timber, bamboo, reed and binding materials like mud and dung are the prime construction materials of Assam-type architecture. As previously stated, the Assam-type buildings built during the British rule, also used materials like glass for glazing windows and door partially,

cement plaster for plastering the walls, brick for a short wall at the ground floor till the sill height, GI sheets as a roof cover and sometimes steel sections at the corners of the house as a vertical supporting member. Cement concrete is only used for the plinth. All the traditional materials are comparatively light weight and modern materials are used in moderation, which makes the overall mass of the building low.

2. Construction Method: The construction method adopted for Assam type buildings is simple and flexible. The overall idea for such construction is to have a strong base, a flexible centre and a light top, and so brick or stone is only used in the plinth or to build a short wall on the ground floor. The construction methodology has been designed and developed over the years primarily to make the building earthquake resistant and climate responsive.

   For example, the wooden frames of the buildings are connected to the light-weight walls and roof using flexible connections. Such a system offers good earthquake resistance [4]. Pitched CGI sheet roofing over timber trusses is the most common form of roofing used in these buildings and is ideal to sustain the heavy rainfall that Assam receives. The most common type of floorings includes cement flooring over an under layer of sand and brick soling and rammed earth floor with mud-dung finish. In double storeys and stilted houses, the upper floors use wooden planks laid over wooden runners and beams.

3. Climate Adaptive Architectural Attributes: As already discussed, climate responsiveness has been the primary focus in the designing of traditional Assam-type buildings, particularly in the context of Assam's tropical climate and monsoons. These features demonstrate how the traditional dwellings are finely tuned to the local climate, promoting comfort and sustainability which effectively responding to the challenges posed by the region's weather conditions. Some of the important climate responsive features in Assam-type buildings are :
   a. Elevated plinth / Stilted Construction for protection from floods or rain water run-off .
   b. Sloping Roof helps to drain off rain water easily.
   c. Bamboo / Thatch ceiling, provides natural insulation and allows better temperature regulation.
   d. Verandas and Courtyards, enhances natural ventilation and acts as a shading device and prevents rain water from damaging the walls.
   e. Ikra/Bamboo walls with mud plaster, helps to regulate interior temperature with its insulating properties.
   f. Wide overhanging eaves, protects walls from rain water and acts as a shading device.
   g. Bamboo screens, usually around verandas provides privacy while allowing airflow.
   h. Low thermal mass, of materials like bamboo and Ikra means that they heat up and cool down relatively quickly.

4. Seismic Resilience Attributes: Traditional Assam type houses are known to have performed very well during earthquakes. The typology is known to have several strengths that influence earthquake safety of the house. These include:
    a. Wood, bamboo and ikra construction: The use of bamboo, ikra and wood for the primary structure plays an important role in the seismic performance of traditional Assam type buildings. Bamboo is known for its flexibility and Wood is also a surprising ductile material due to its high strength relative to its lightweight structure. The lightweight and flexible nature of these materials allows it to absorb energy and sway during an earthquake reducing the structural damage [4].
    b. Lightweight Materials: The lightweight construction materials ensure that there is less mass to move during an earthquake which reduces the force transmitted to the foundation.
    c. Flexible Connections: The flexible connections allow movement during seismic activity and thus reduces the risk of structural failure [4].
    d. Smaller openings: Large openings weaken walls from carrying the inertia forces in their own plane. Smaller opening in traditional Assam type houses help in its seismic performance [6].
    e. Symmetrical Design: Most traditional houses have symmetrical layouts, usually accompanied by courtyards. The symmetry helps in distributing the seismic forces evenly reducing tortional effects [7].
    f. Roof structure: The simple and light roof structures ensures that damages caused in case of collapse are minimal [4].
5. Spatial Configuration: The Assam Type buildings typically follow some layouts as shown in the figure 1. The typical arrangement of rooms is based on the function and size of the building. The residences usually have a semi covered veranda / porch which either surrounds the building on all sides or the longer sides. This semi covered veranda not only serves as a shading device which protects the mud plastered walls from being washed off by the rain, but also serves as an informal multi-use space.

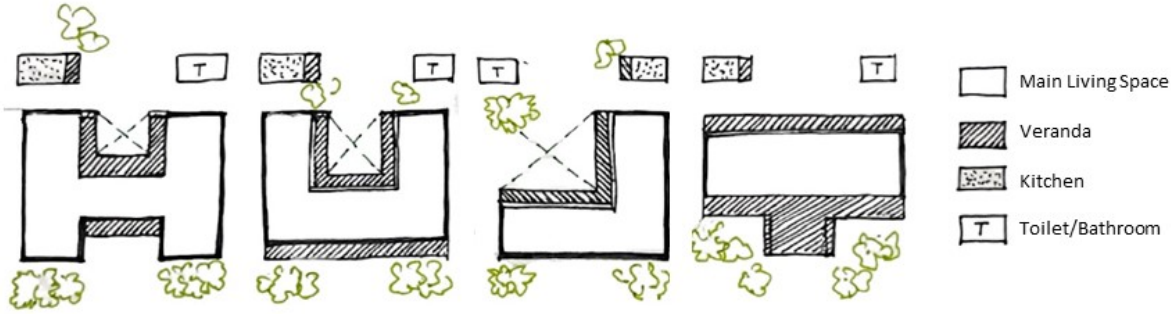


Fig. 4: Sketch showing the common layouts of Traditional Assam-type houses. (Source: Sketch developed by author based on figures from Housing Report- Assam Type House [4] and case study observations)

These buildings usually have a symmetrical layout which is also manifested in its elevation. One of the very common forms for medium to large buildings is the H and U shaped. This arrangement of spaces, automatically creates a courtyard, which also serves as a buffer between the kitchen, bathroom-toilet and the main house. Keeping the kitchen away from the main house was important with respect to fire safety. This courtyard along with the veranda serves as a private area, which is used for several activities like drying of cloths or grains and even as a informal and private family space. It is also worth noting that the framed structure and symmetrical layout lend inherent modularity to the spaces, facilitating straight forward expansion if required.

6. Aesthetic attributes: The Assam-type buildings are recognised for their unique visual identity. They serve as an enduring symbol of Assam's and North-East India's regional identity for several reasons.
    a. Multi gable roof: The pitched roof in Assam-type buildings in itself is an element which creates visual interest. The roof designs specially in larger buildings are complex with multiple slopes in different sizes, and sometimes topped with a roof lantern.
    b. Decorative Bargeboard : It is another feature on the roof which enhances the visual appeal of the Assam-type buildings.
    c. Neutral Colour palette: The traditional buildings are usually coated with lime , while leaving the wooden framework to be painted with black bitumen. The black bitumen paint not only helps in weatherproofing the wood but also creates a contrast with the white lime which enhances the distinctive identity of these buildings.
    d. Proportion and Symmetry: Traditional Assam Type houses are usually symmetrical, well-proportioned and always has a sense of balance.
    e. Minimalist Design: The simplicity of its design and clean lines conveys a minimalist impression and easily harmonise with the natural landscape making them unobtrusive and pleasant.

4. CONTEMPORARY ASSAM-TYPE DWELLINGS

The preference for RCC (Reinforced Cement Concrete) buildings grew in the second half of the 20th century. After Shillong was replaced by Guwahati as the capital of Assam in 1972, the new capital

The buildings, recognised as 'Assam-type' and being built in present Assam, are RCC buildings. These are usually single storey houses with sloping roofs and a small semi open veranda in front, which resembles the façade of a traditional Assam-Type house to some extent. The bamboo screens of traditional houses are replaced with fabricated steel grills. These buildings too are built on a raised plinth.

The architectural design typically features a rectangular structure with a front-side porch. The incorporation of a rear courtyard is relatively uncommon and is notably absent in majority of these buildings. This typology is mostly used for residences.

Figure 5 : A contemporary Assam-type house (Source : Photographed by Author)

The foundation and superstructure follow the construction typology of a RCC framed structure, with reinforced concrete beams and columns, and brick masonry walls. The roof truss consists of wooden rafters supported by the beams, topped with CGI sheets just like the traditional typology, although some buildings also use steel trusses. Sal wood is preferred as the material for the doors, windows, and ventilators but sometimes the high cost and unavailability of the same results in the use of cheaper variety of timber or engineered wood.

Materials like wood and woven bamboo mats and asbestos cement sheets are often used for the ceilings. Nevertheless, the newer constructions often have gypsum or POP (Plaster-of-Paris) ceilings.

The house plans are simple, with 4 to 6 rooms in most buildings. The use of modern materials reduces the risk of fire and thus the kitchen, toilets and bathrooms are attached usually to the main house and located on the rear end of the building.

5. CASE STUDY

Three locations in Assam have been identified for the case studies, namely the capital city of Guwahati, the historic settlements of Sualkuchi and Hajo and the sub-urban and fast developing town of Goalpara.

The case study comprises of two examples from each town/city, one being a traditional Assam-type house and the other a contemporary Assam-type house. The identified buildings have been studied and put together side by side for a comparative analysis.

Guwahati: Guwahati being the largest city of Assam has been most vulnerable to changes owing to urbanisation. Although some important traditional Assam-type buildings are still present in the city, most have succumbed to urbanisation. The city boundaries have been expanding, and the smaller towns and villages coming within the boundaries are following the trait.

Figure 6 : Study of a traditional and a contemporary Assam-Type house in Guwahati. Please note that the drawings are not to scale. (Source: Author)

a. Sualkuchi and Hajo: Sualkuchi and Hajo are adjacent towns and have been historically and culturally very important to the state. Where Sualkuchi serves as the primary centre to produce traditional Assam silk, the town of Hajo has been a very important religious centre for both Hindus and Muslims, due to the presence of important shrines and temples catering to both religions. Both these towns have excellent examples of its traditional built environment.

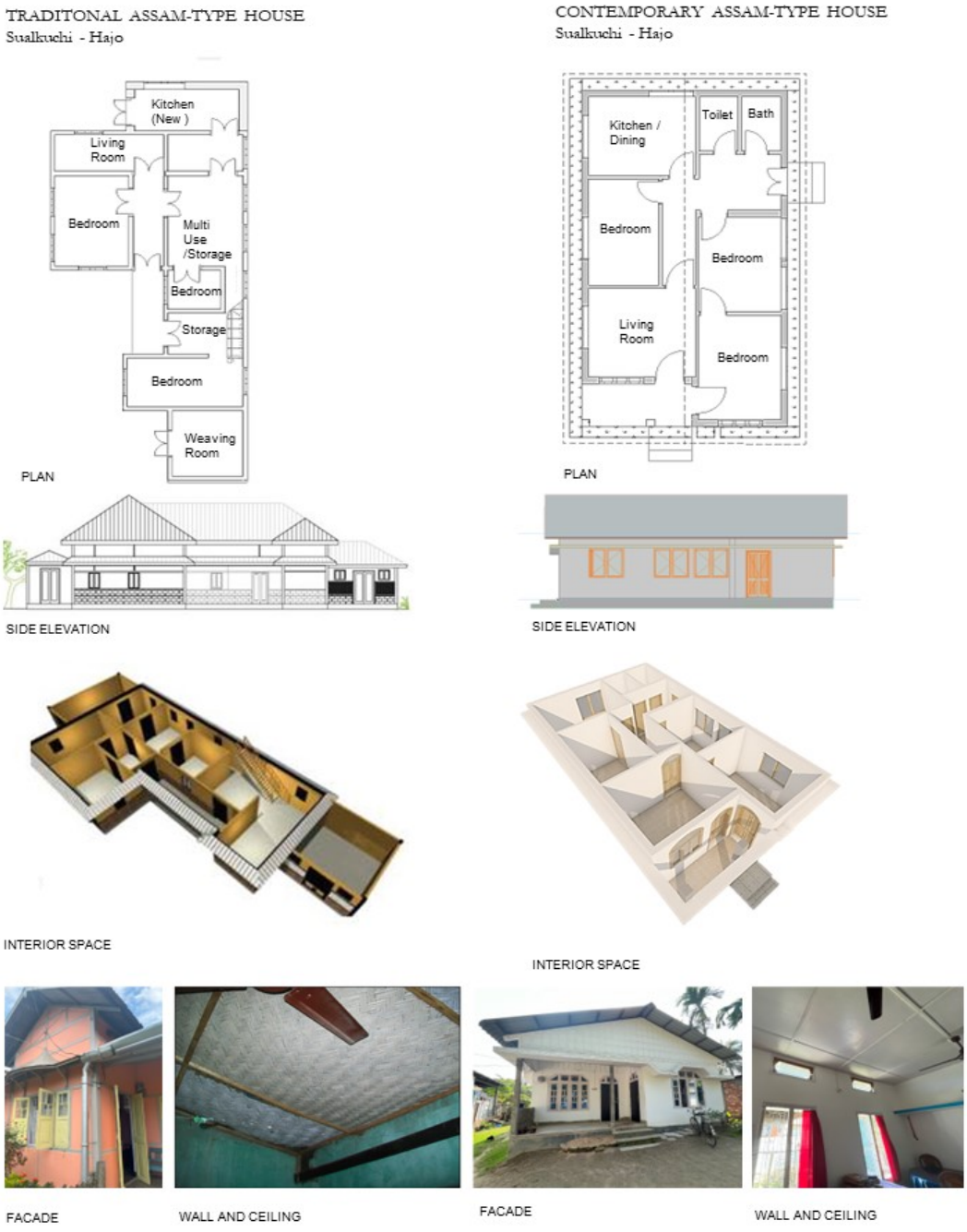


Figure 7: Study of a traditional and a contemporary Assam-Type house at Sualkuchi- Hajo Area. Please note that the drawings are not to scale. (Source: Author)

b. Goalpara: The third location, the town of Goalpara is a district headquarter and is developing fast. It is listed among one of the proposed cities/towns of Assam to be upgraded as a smart city, approved by the Union cabinet under the Smart city vision of the Indian government [8].

Figure 8: Study of a traditional and a contemporary Assam-Type house in Goalpara. Please note that the drawings are not to scale. (Source: Author)

6. COMPARING TRADITIONAL AND CONTEMPORARY ASSAM-TYPE DWELLINGS

SL. NO	PARTS OF A BUILDING	TRADITIONAL MATERIALS	CONTEMPORARY MATERIALS	TRADITIONAL CONSTRUCTION METHOD	CONTEMPORARY CONSTRUCTION METHOD
1	Foundation	Timber	Concrete, Steel	No formal foundation, Wooden columns pierced into ground or supported on masonry.	Shallow RCC foundation
2	Plinth and floor	Brick, Stone, Mud, Concrete	Concrete, Steel	Rammed Earth or Brick/Stone masonry and cement flooring over an under layer of sand or brick soling	RCC plinth with Cement floor with an under layer of brick soling.
3	Framework	Wood, Timber	Concrete, Steel	Wood columns, Wooden horizontal and vertical members forms the framework.	RCC beams and columns
4	Walls	Ikra, Bamboo, brick	Brick	The wood framework is infilled with woven ikra and bamboo panels.	Brick Masonry
5	Fenestrations	Wood, Glass	Wood/Engineered wood, Glass, Steel	Wooden doors, windows, and ventilators, with glazing, usually double panelled shutters.	Wooden doors, windows and ventilators with glazing
6	Ceiling	Bamboo, Wood, Ikra	Bamboo, Asbestos, Gypsum, POP	Woven bamboo mats or ikra supported by wooden strips.	Woven bamboo mats or asbestos sheets supported by wooden strips or Gypsum/POP top hung ceilings.
7	Roof	Ikra, Thatch, CGI Sheets	CGI Sheets	Wooden truss covered with Ikra tied to purlins or CGI sheets connected with J bolts.	Wood or steel truss with CGI sheets placed on top and fixed with bolts.
8	Finish	Mud-Dung, Lime, Bitumen	Cement, Paint, Ceramic Tiles	Mud-dung plaster laid over Ikra-bamboo wall panels. Coated with lime. The wooden members are coated with bitumen.	Walls are cement plastered and painted. Floor is usually plastered with cement or sometimes covered with ceramic tiles.

Table 1: Comparison of traditional and contemporary construction materials and methods.

SL. NO	ELEMENTS OF THE BUILDING	CLIMATE RESPONSIVE ATTRIBUTES	ATTRIBUTES OF SEISMIC PERFORMANCE	TRADITIONAL ASSAM-TYPE BUILDING	CONTEMPORARY ASSAM-TYPE BUILDING
1	Plinth and floor	Elevated plinth – Protects from rain water runoff/ flood		Present	Present
2	Framework	Wooden framework Ikra/ bamboo walls - Provides insulation, allows better temperature regulation	Flexible Connections, allows movement during seismic activity.	Present	Absent
3	Walls	Low Thermal Mass	Bamboo Ikra construction is flexible and light weight.	Present	Absent
4	Fenestrations	Small openings places strategically- Provides cross ventilation	Smaller openings – Larger openings weakens walls.	Present	Absent
5	Ceiling	High ceiling made with Bamboo mat /thatch/wood plank - Natural Insulation, better temperature regulation		Present	Sometimes present or replaced with Gypsum, Asbestos sheets.
6	Roof	Sloping Roof - Helps to drain rain water easily	Simple and lightweight – Ensures minimal damage if collapsed.	Present	Present
7	Finish	Mud-Dung Plaster, Lime bitumen coating - Mud plaster has low thermal mass, cools quickly, regulates temperature Organic		Present	Absent
8	Shading devices	Bamboo Screen - Provides airflow while retaining privacy Overhanging eaves – Acts as shading device and protects walls from rain water.	Light weight overhangs enhance seismic performance.	Present	Absent
9	Layout	Long verandas - running along the longer sides provides shade and protects walls Courtyards – promote better ventilation	Symmetrical Design – helps in distributing seismic forces evenly.	Present	Absent

Table 2: Climate responsive and seismic resilience attributes of traditional and contemporary assa-type buildings.

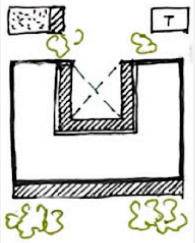
SL. NO	ATTRIBUTE OF SPATIAL CONFIGURATION	IMPORTANCE	TRADITIONAL ASSAM-TYPE BUILDING	CONTEMPORARY ASSAM-TYPE BUILDING	REMARKS
1	Symmetrical layout	Makes it visually pleasing, enhances visual balance, Enhances seismic performance.		 Contemporary houses are usually rectangular and unsymmetrical.	
2	Courtyard	Acts as an informal family space, utilitarian space for different daily activities		Most contemporary Assam-type houses do not have courtyards.	Users suggest that courtyards are not as necessary now as it used to be in the past.
3	Veranda along longer sides	Acts as a shading device, protects walls from rain water damage, provides an informal sitting area.		Contemporary Assam-type houses usually have a front porch rather than a long veranda.	.
4	Modularity	Symmetrical layout and wooden framed structure, makes the building modular and thus expansion becomes easier.		Concept of modular spaces is absent.	
5	Kitchen, Bathroom and Toilet location	With materials vulnerable to fire, kitchens are located away from the main house. Toilets and bathing areas are located closer to the water source for feasibility.		Not applicable as modern materials are less vulnerable to fire. Users prefer attached bathrooms and toilets due to feasibility, since running water is readily available inside the house.	It has been observed that most users of traditional Assam-Type houses are opting to construct new kitchen and toilet, close to main building, and with modern materials.

Table 3: Comparing imporatnt spatial configuration features of traditional and contemporary assam-type buildings.

SL. NO	AESTHETIC ATTRIBUTES	TRADITIONAL ASSAM-TYPE BUILDING	CONTEMPORARY ASSAM-TYPE BUILDING	REMARKS
1	Roof	Traditional Assam-type houses have Multi – Gable Roofs, sometimes with roof lanterns.	Roofs are single gabled.	 Multi gable roof with roof lantern in a traditional house
2	Ornamentation	Ornamentation is found only in the form of decorative Barge boards, which are intricately carved in wood.	No regular pattern followed. Sometimes, basic patterned relief art is seen on some facades.	 Carved wood barge board in a traditional house.
3	Bamboo screens	Woven bamboo screen around the verandas adds an aesthetic element while serving its function.	Fabricated steel grills are used where necessary, usually for safety, but also acts as a décor element.	 Bamboo screens in traditional houses.
4	Proportion and Symmetry	Symmetry is not only seen on the plan but also in elevation. The facades design and placement of windows are meticulously made symmetrical and visually balanced.	Contemporary Assam-type houses are mostly rectangular, with the gable end facing the front. Symmetry is not the priority.	
5	Minimalist Design	Minimalist design and clean lines, blends with natural surroundings.	Design overall is minimal, but sometimes adorned with decorative grill designs, relief art etc.	
6	Colour palette	Neutral colour palette, some times with a contrasting colour on the wooden framework, traditionally derived from lime and bitumen.	Colour palette depends on latest trends. Use of contrasting and vibrant colours are often seen at present.	 Vibrant colours in contemporary Assam-type.

Table 4: Comparing imporatnt aesthetical features of traditional and contemporary assam-type buildings. (Sources of Images : Author's archive)

7. DISCUSSION

The architectural landscape of Assam has witnessed a transition from traditional Assam-type buildings to its contemporary version. Traditional Assam-type buildings exhibited notable characteristics that render them distinct. Based on thorough analysis of scholarly literature and experts' opinions, a set of attributes were identified. The comparative analysis of the two, based on those attributes reveals an intriguing desire to blend modernity with the deep-rooted traditions. It is noteworthy that the contemporary Assam-type buildings, while striving to fulfil that desire , often fall short of preserving the greater qualities of the traditional Assam-type architecture.

Contemporary Assam-type houses undoubtedly offer several advantages in terms of feasibility of construction and maintenance along with modern conveniences, but they often deviate from the traditional attributes that have been the hallmark of Assam's architectural legacy.

For example, when we consider the determining features of Assam-type dwellings, with respect to materials and construction methods, it is very evident from Table 1 that, the materials, and methods of construction in contemporary dwellings are very different from traditional ones. While it is acceptable to upgrade materials and methods of construction based on modern technology and feasibility; Table 2 demonstrates how several important sustainable features and principles which have been intrinsic to traditional Assam-type dwellings are ignored in contemporary designs. In contrast to traditional Assam-type buildings, the contemporary constructions have increasingly shifted towards conventional construction materials like cement, concrete, bricks, and steel. This transition not only reflects a departure from sustainability but also results in a higher ecological footprint due to the energy-intensive production and transportation of these materials. This oversight can result in decreased energy efficiency and resilience against environmental challenges which Assam faces every year.

However, it will be unfair to comment that the Traditional dwellings did not have any shortcomings. Fire safety for example has been a major reason for the preference of modern materials over traditional ones. Secondly, experts also suggest that although the traditional constructions are cheaper, skilled labour and natural materials are not as easily available as brick and cement.

This spatial configuration of traditional houses promoted natural ventilation, social interaction, and adaptability. The spatial design of the contemporary houses substantially deviates from traditional layouts, sometimes favouring enclosed designs with fewer communal spaces. With the increased demand and rising cost of habitable land in cities and towns, open spaces around a house has reduced in size. It is because of

this reason and the reduced requirement of a courtyard for activities like drying or pounding grains in modern days, one can visibly see the slow eradication of courtyards in contemporary architectural plans.

Traditional houses boasted unique aesthetics characterized by multi-gabled roofs, symmetrical facades, and intricate detailing of barge boards, while retaining a minimalist aura. The aesthetical quality naturally evolved in traditional dwellings while the design's focus had been on function. These design elements were deeply rooted in Assam's cultural heritage. Contemporary houses on the other hand, many a times influenced by global architectural trends, prioritize different aesthetic attributes, often featuring modern façades and materials, and neglects the distinctive visual identity associated with traditional Assam type houses.

8. CONCLUSION

Tradition is not defined by rigidity or stagnation; nor is tradition a historical entity that needs to be preserved as it is. The core concept of traditional architecture is that it has evolved as a result to meet the needs of the local social community and thus it varies from region to region and community to community. It is dynamic and unfolds with time and situation.

Thus, it is not incorrect to say that Assam-type of architecture is also dynamic. Moreover, reinterpretation of tradition or traditional architecture is not something that Assam has not witnessed in the past. Let us not forget that the Assam-type building design that was developed during the British colonial rule, was also an evolved and reinterpreted version of the original vernacular Assam-type dwelling and was a contemporary typology for that time period. It was only decades later that that typology came to be identified as the traditional Assam-type house. Nevertheless, there is a difference between the then developed Assam-type architecture and the one we see developing today. The then developed Assam-type not only adopted the important features of the original vernacular Assam-type but also upgraded it keeping in mind the socio-cultural, sustainable, environmental as well as aesthetic values of the region.

Unfortunately, it is not the same with the present new typology. The key features such as sustainable materials, climate-adaptive design, seismic resilience, favourable spatial configurations, and cultural aesthetics are frequently sacrificed in favour of contemporary construction norms and trends. The need to blend in with the modern and global world, and the inclination towards a vague misinterpreted idea of tradition has led to this new typology, which is although called as the 'new Assam-type', does not live up to its name.

This transition underscores the need to strike a balance between preserving Assam's rich architectural heritage including the traditional knowledge system of design and construction and addressing the practical needs of modern living, all while considering sustainability and environmental impacts. It emphasizes the significance

of adapting traditional wisdom to confront contemporary challenges without erasing the essence of Assam's architectural legacy.

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THE COMPOUND: GATED COMMUNITIES AS A NEW HOUSING AND PLANNING TRADITION IN CAIRO

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THE COMPOUND: GATED COMMUNITIES AS A NEW HOUSING AND PLANNING TRADITION IN CAIRO

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This paper is about how Gated communities have become a prominent feature of urban landscapes around the world, including Egypt. This article aims to provide an in-depth exploration of the introduction of gated communities in Egypt, the reasons behind their popularity, the demographics of occupants, the role of the government in their development, and the architectural considerations that shape these communities.

1. INTRODUCTION: HISTORICAL CONTEXT AND INTRODUCTION OF GATED COMMUNITIES IN EGYPT

1.1. Overview of the Emergence of Gated Communities:

Gated communities have gradually emerged in Egypt over the past few decades, reflecting global trends in urban development. The concept of gated communities originated in the United States in the mid-20th century as a response to various factors such as rising crime rates, suburbanization, and the desire for exclusive living environments. Over time, this concept spread to other parts of the world, including Egypt.

In Egypt, the introduction of gated communities gained momentum in the 1990s and early 2000s. This period witnessed rapid urbanization, population growth, and increased urban crime rates. As a result, gated communities emerged as a perceived solution to address security concerns and provide a sense of safety and exclusivity to residents. The map in fig (1) indicates the master plan of greater Cairo, with increase in the region's to about 757.000 acres in 2010. But The map in fig (2) indicates the new cities around GCR.

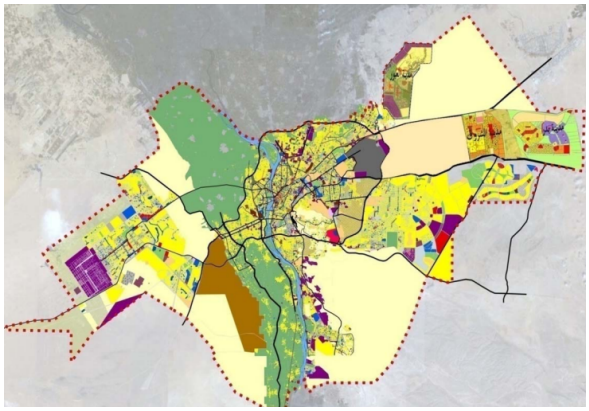

Fig. 1. GCR, 2010 (Source: GOPP, 2011)

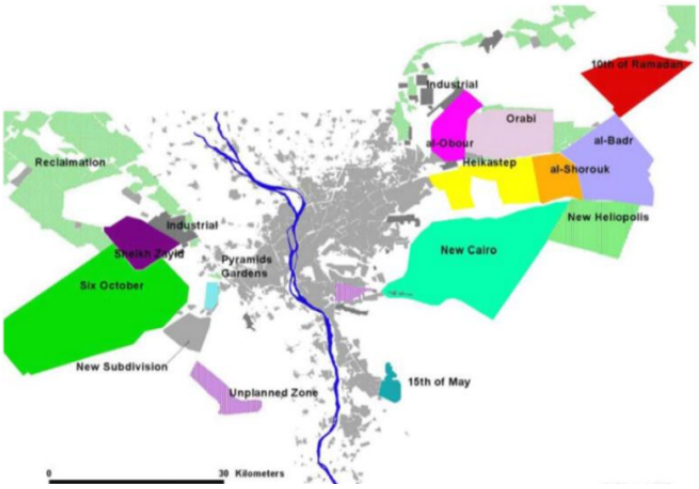

Fig. 2. New cities around GCR (Source: Sims, David and Séjourné, Marion. Understanding Cairo, 2006)

1.2. Factors Influencing the Adoption of Gated Communities in Egypt

Several factors have influenced the adoption of gated communities in Egypt, shaping their popularity and growth.

- **Security Concerns:** One of the primary drivers behind the rise of gated communities in Egypt is the pervasive issue of urban crime. High crime rates, including theft, and burglary, have created a sense of insecurity among residents. Gated communities offer a controlled environment with restricted access and security measures such as perimeter walls, guarded entrances, and surveillance systems, providing residents with enhanced security and peace of mind.
- **Socioeconomic Factors:** The adoption of gated communities in Egypt is also influenced by socioeconomic factors. As the middle class expanded and experienced upward mobility, there was a growing desire for improved living standards and social status. Gated communities, with their exclusive amenities, landscaped surroundings, and perceived higher social status, became an aspirational lifestyle choice for many middle-class Egyptians.
- **Urbanization and Overcrowding:** Rapid urbanization and population growth in Egypt have led to overcrowding in cities, with associated challenges such as strained infrastructure, traffic congestion, and limited public spaces. Gated communities offer an escape from the chaos and density of urban areas, providing a more controlled and well-planned living environment, often with ample open spaces, landscaped gardens, and recreational facilities.

1.3. Comparative Analysis of Gated Communities in Egypt and Other Countries

- When comparing gated communities in Egypt to those in other countries, several key aspects can be examined:
- Cultural Context: Gated communities in Egypt are influenced by the country's unique cultural and social dynamics. Egyptian society places importance on family ties and privacy, which contribute to the appeal of gated communities as they offer a sense of seclusion and security. Moreover, cultural preferences for community-oriented living and shared public spaces often shape the design and amenities within these communities.
- Scale and Density: Gated communities in Egypt vary in scale and density. Some developments consist of large-scale compounds with extensive facilities, while others are smaller, more intimate communities. This diversity reflects the needs and preferences of different socioeconomic segments and offers residents a range of choices.
- Government Regulations and Planning Policies: The regulatory framework and planning policies surrounding gated communities differ from country to country. In Egypt, the government has played a role in facilitating the development of gated communities through planning regulations, public-private partnerships, and infrastructure support. Comparative analysis allows for an examination of how government policies shape the characteristics and functioning of gated communities in Egypt compared to other countries.
- By understanding the historical context and factors influencing the adoption of gated communities in Egypt, as well as conducting a comparative analysis with other countries, we gain valuable insights into the emergence and unique characteristics of gated communities in the Egyptian urban landscape.

2. REASONS FOR THE POPULARITY OF GATED COMMUNITIES IN EGYPT

2.1. Perceived Security and Safety

- **Security Measures in Gated Communities:**

  Gated communities in Egypt invest heavily in security infrastructure and measures to ensure the safety of residents. These measures include security personnel stationed at entry points, CCTV surveillance systems, perimeter walls or fences, and sometimes even advanced technologies like biometric access control systems. These security features provide a sense of reassurance to residents and contribute to the appeal of gated communities.

2.2. Socioeconomic Factors

- Middle-Class Aspirations and Social Status:

The popularity of gated communities in Egypt is driven, in part, by the aspirations of the middle class. As the middle class expands and experiences upward mobility, there is a desire for improved living standards and social status. Gated communities, with their exclusive amenities, well-maintained landscapes, and perceived higher social standing, have become a symbol of success and achievement for the middle class.

- Economic Disparities and Gated Community Affordability:

While gated communities are often associated with luxury and exclusivity, there is a range of developments catering to different socioeconomic segments in Egypt. Developers have recognized the demand for gated living across various income levels and have introduced more affordable options. These developments provide middle-income Egyptians with an opportunity to access the benefits of gated communities, including security, amenities, and a higher quality of life.

2.3. Urbanization and Overcrowding

- Urbanization trends are another factor that has contributed to the growth of gated communities and compounds.
- Several factors have contributed to the growth of gated communities and compounds in Cairo. One of the primary factors is changing demographics. The population of Cairo has increased significantly over the past few decades, with a rise in the number of middle- and high-income earners who seek a higher standard of living. These individuals are looking for housing that provides a sense of security, exclusivity, and luxury, which traditional apartment buildings are unable to provide.
- **Infrastructure Strain and the Appeal of Controlled Environments:**
  Rapid urbanization and population growth in Egypt have strained urban infrastructure, leading to issues such as traffic congestion, inadequate public spaces, and limited recreational areas. Gated communities offer a solution by providing well-planned environments with controlled access, dedicated amenities, and open spaces. Residents are attracted to the idea of living in communities that prioritize their needs and offer a respite from the challenges of overcrowded urban areas.
- **Impact on Urban Sprawl and Land Use Patterns:**
  The popularity of gated communities in Egypt has also contributed to urban sprawl, as these developments often occupy large areas of land on the outskirts of cities. This expansion results in the conversion of agricultural or undeveloped land into residential spaces. The growing demand for gated communities has influenced land use patterns and urban planning strategies, leading to the

development of new suburban areas that cater to residents seeking a more controlled and exclusive living environment.

2.4. Social and Lifestyle Aspirations

- Gated communities and compounds offer a range of housing options, from apartments to villas. However, villas are the most common type of housing within these communities. Villas are designed to cater to the needs of the affluent, with large living spaces, high-quality finishes, and private outdoor areas. The design of gated communities and compounds in Cairo is influenced by the desire to create a sense of exclusivity and separation from the rest of the city. The communities are often designed with a single entrance and exit point, and with high walls or fences surrounding the perimeter.
- Changing lifestyles and the desire for a particular way of life have also contributed to the growth of gated communities and compounds. People are looking for a place where they can live in a community of like-minded individuals who share the same values and interests. Fig (3) refers to residential buildings by type in the new cities of GCR in 2017.

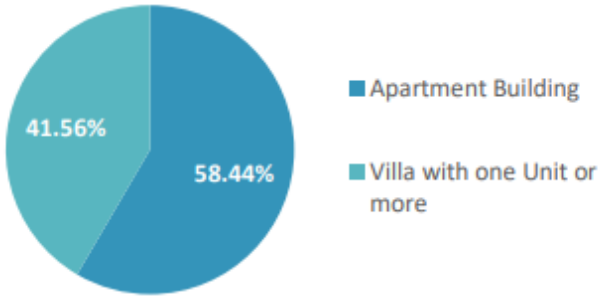

Fig. 3. Residential Buildings Type in New Cairo cities (Source: CAPMAS, 2017)

- Community Amenities and Shared Recreational Spaces:
  Gated communities in Egypt often offer a wide range of amenities and shared recreational spaces. These may include parks, playgrounds, sports facilities, clubhouses, swimming pools, and community centers. Such amenities create a sense of community and provide residents with opportunities for social interaction, relaxation, and leisure activities. The availability of these facilities within a secure and private setting is an attractive feature for individuals and families seeking a desirable lifestyle.
- Social Homogeneity and Exclusivity:
  Gated communities in Egypt tend to attract residents who share similar socioeconomic backgrounds,

lifestyles, and aspirations. This social homogeneity and exclusivity contribute to the appeal of gated living. Residents often perceive these communities as exclusive enclaves that offer a sense of belonging and the opportunity to interact with like-minded individuals. The shared values and lifestyle preferences within gated communities foster a sense of community and build social connections.

- By addressing the desire for security, socioeconomic factors, urbanization and overcrowding challenges, and social and lifestyle aspirations, we can understand the multifaceted reasons behind the popularity of gated communities in Egypt.

3. GOVERNMENT'S ROLE IN THE DEVELOPMENT OF GATED COMMUNITIES

A. Planning and Regulatory Frameworks

Rapid urbanization and population growth in Egypt have led to overcrowding in cities, with associated challenges such as strained infrastructure, traffic congestion, and limited public spaces. Gated communities offer an escape from the chaos and density of urban areas, providing a more controlled and well-planned living environment, often with ample open spaces, landscaped gardens, and recreational facilities. Fig (4) indicates the number of gated communities and their distribution across the Greater Cairo region. This indicates its spread throughout Cairo and the investment of the public and governmental sectors in this type.

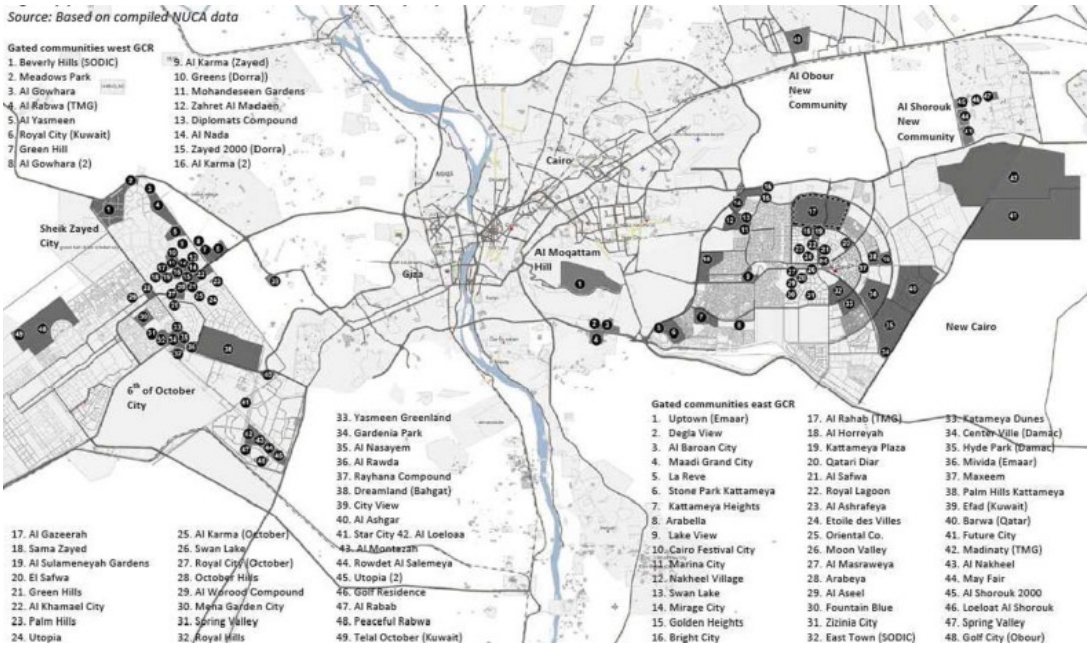

Fig. 4. Gated communities in the Greater Cairo Region (GCR)
(Source: Based on compiled NUCA data)

The government plays a crucial role in shaping the development of gated communities through planning and regulatory frameworks. These frameworks establish guidelines and standards for the design, construction, and operation of gated communities. They ensure compliance with building codes, safety regulations, and environmental considerations. The government's involvement in regulating land use and urban planning helps create a conducive environment for the development of gated communities.

B. Public-Private Partnerships and Incentives:

Governments often engage in public-private partnerships (PPPs) to facilitate the development of gated communities. These partnerships involve collaboration between government entities and private developers to leverage resources, expertise, and funding. Governments may provide incentives to attract private investment in gated community projects, such as tax benefits, streamlined approval processes, or access to infrastructure and utilities. PPPs and incentives encourage private developers to participate in the creation of gated communities, thus expanding housing options for residents.

C. Infrastructural Support and Amenities:

Rapid urbanization and population growth in Egypt have strained urban infrastructure, leading to issues such as traffic congestion, inadequate public spaces, and limited recreational areas. Gated communities offered - planned environments with controlled access, dedicated amenities, and open spaces. Residents are attracted to the idea of living in communities that prioritize their needs and offer a respite from the challenges of overcrowded urban areas.

Images of Gated Communities

The government provides infrastructural support to gated communities, ensuring the provision of essential services and amenities. This includes the development of road networks, water and sewage systems, electricity supply, and other utilities required for the functioning of these communities. Governments may also invest in the construction of public facilities and amenities like schools, healthcare centers, parks, and recreational spaces in the vicinity of gated communities, enhancing the overall quality of life for residents.

D. Critiques and Challenges to Government Involvement:

The popularity of gated communities in Egypt has also contributed to urban sprawl, as these developments often occupy large areas of land on the outskirts of cities. The growing demand for gated communities has influenced land use patterns and urban planning strategies, leading to the development of these new controlled and exclusive living environments.

While government involvement in the development of gated communities can bring several benefits, it is not without its challenges and criticisms. Some of the critiques include:

- Social Inequality and Exclusivity: Critics argue that the government's support for gated communities perpetuates social inequality by focusing resources and amenities on a privileged few. These communities may cater to a specific socioeconomic segment, further deepening divisions within society.
- Urban Fragmentation and Inequality: The concentration of resources and amenities within gated communities can contribute to urban fragmentation and spatial inequality. Critics argue that this can lead to the neglect of public spaces and services in non-gated areas, exacerbating social disparities and creating a sense of exclusion for those outside gated communities.
- Limited Affordable Housing: Critics contend that government support for gated communities may divert resources away from the development of affordable housing options. This can exacerbate the housing affordability crisis, particularly for low-income households who may not have access to the benefits of gated communities.
- Environmental Impact: The development of gated communities on the outskirts of cities can lead to urban sprawl and the conversion of agricultural or green areas into residential spaces. This has environmental implications, including the loss of natural habitats, increased energy consumption, and additional strain on infrastructure and resources.
- Lack of Community Integration: Some critics argue that gated communities can contribute to social isolation and a lack of community integration. The physical barriers and controlled access may hinder interactions with the surrounding neighborhoods and limit social diversity.

4. DEMOGRAPHICS OF GATED COMMUNITY OCCUPANTS

A. Socioeconomic Background and Income Levels

Gated communities often attract residents from specific socioeconomic backgrounds due to their higher housing costs and the amenities they offer. Occupants of gated communities tend to have relatively higher income levels compared to the general population. These communities provide a sense of exclusivity, privacy, and security, which appeals to individuals or families with the financial means to afford such amenities. The socioeconomic diversity within gated communities can vary, with some catering to the upper-middle class and others targeting high-net-worth individuals.

B. Cultural and Social Preferences:

Cultural and social preferences also play a role in the demographics of gated community occupants. In some cases, specific cultural or social groups may seek out gated communities as a means to maintain their cultural

practices, religious beliefs, or social networks within a controlled and familiar environment. This can be particularly relevant in countries with diverse populations where residents may desire a community that aligns with their cultural values and traditions.

C. Generational Differences in Preferences:

Gated communities often attract residents from specific socioeconomic backgrounds due to their higher housing costs and the amenities they offer.

Generational differences can influence the preferences of gated community occupants. Older generations may be drawn to gated communities as they offer a sense of security and a quieter, more private living environment. They may appreciate the community's amenities and services that cater to their needs, such as healthcare facilities, recreational activities, and proximity to social networks. Younger generations, on the other hand, may value the convenience, lifestyle amenities, and social opportunities that gated communities provide. They may also be attracted to the idea of raising children in a controlled and safe environment.

D. Role of Expatriates and Foreigners:

Gated communities often attract expatriates and foreigners who are relocating to a new country or city. These communities can offer a familiar and secure living environment, making the transition to a new culture and society easier. Expatriates and foreigners might find comfort in the presence of like-minded individuals or those from similar backgrounds within gated communities. Additionally, gated communities may provide services and amenities that cater specifically to the needs and preferences of expatriates, such as international schools, cultural centers, and support networks.

It's important to note that the demographics of gated community occupants can vary significantly depending on the specific location, cultural context, and the target market of each community. The factors mentioned above should be considered as general trends rather than universal characteristics.

Overall, the demographics of gated community occupants are shaped by socioeconomic factors, cultural and social preferences, generational differences, and the presence of expatriates and foreigners. Understanding these demographic dynamics is crucial for developers, policymakers, and urban planners as they strive to meet the housing needs and preferences of diverse populations.

5. ARCHITECTURAL CONSIDERATIONS IN GATED COMMUNITIES

A. Design Principles and Aesthetics:

1. Architectural Styles and Influences:

Gated communities often incorporate specific architectural styles and influences to create a cohesive and visually appealing environment. These styles can vary based on the preferences of the target market, local context, and regional architectural traditions. For example, Mediterranean, Spanish, or Contemporary styles are commonly found in gated communities. Architectural elements such as building materials, facades, roof designs, and decorative details are carefully considered to create a sense of luxury, exclusivity, and harmony within the community.

2. Integration of Local and Cultural Elements:

Gated communities may strive to integrate local and cultural elements into their design to establish a connection with the surrounding context. This integration can be achieved through the use of traditional materials, architectural motifs, or design elements that reflect the local heritage and culture.

B. Security Features and Access Control:

1. Perimeter Design and Boundary Delineation:

Security is a fundamental aspect of gated communities, and their architectural design reflects this concern. The community's perimeter is carefully designed to create a clear boundary between the private and public spaces. This can include physical barriers such as walls, fences, or hedges that provide a sense of enclosure and discourage unauthorized access. The design also takes into account factors like visibility, lighting, and landscaping to enhance security measures while maintaining an aesthetically pleasing appearance.

2. Surveillance Systems and Entry Points:

Gated communities employ various security measures, including surveillance systems and controlled entry points.

C. Community Spaces and Amenities:

1. Recreational Facilities and Common Areas:

Gated communities often provide a range of recreational facilities and common areas to enhance residents' quality of life. These amenities can include swimming pools, fitness centers, parks, playgrounds, sports facilities, and community centers. The architectural design of these spaces focuses on creating functional and attractive environments that promote social interaction, leisure activities, and a sense of community.

2. Landscape Design and Green Spaces:

The incorporation of well-designed landscape elements and green spaces is an important consideration in gated community architecture. The design may feature manicured gardens, tree-lined streets, walking paths, and open green areas. These elements not only contribute to the aesthetic

appeal but also provide a sense of tranquility, privacy, and environmental sustainability within the community.

D. Housing Typologies and Spatial Organization:

1. Villa-Style Residences and Townhouse Complexes:

Gated communities often offer a variety of housing typologies, with villa-style residences and townhouse complexes being common choices. The architectural design of individual houses and multi-unit buildings within the community emphasizes privacy, luxury, and comfort. The layout and spatial organization of these residences focus on functional spaces, private outdoor areas, and integration with the overall community design.

2. Gated Community Master Planning and Neighborhood Layouts:

The master planning and neighborhood layouts of gated communities consider factors such as road networks, traffic flow, and spatial organization. The architectural design ensures a well-structured community with clear zoning for residential, commercial, and recreational areas. The layout may include cul-de-sacs, pedestrian-friendly pathways, and centralized community spaces to promote walkability, safety, and a sense of community cohesion.

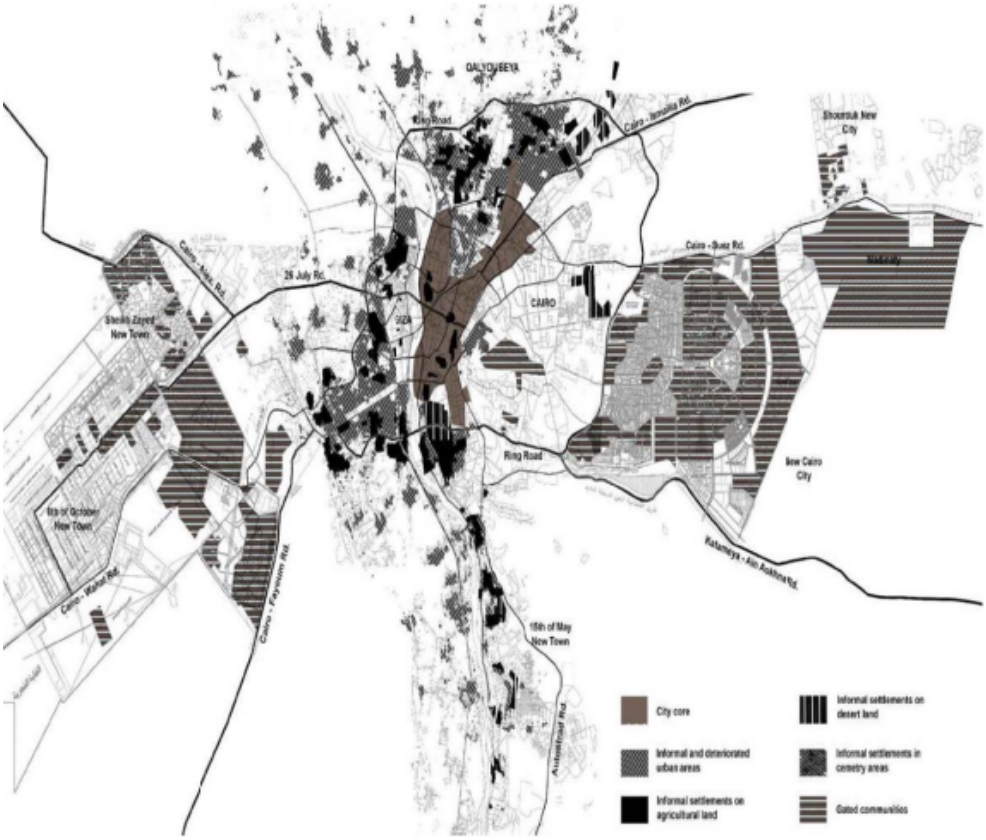

Fig. 5. The map indicates the gated communities in the new cities around the GCR, in addition to the informal areas around the GCR. (Source: (Yousry, 2009), (Ghonimi et-al, 2011), (Mekawy& Yosry, 2011))

6. CASE STUDIES: HOUSING TYPOLOGIES AND SPATIAL ORGANIZATION

6.1. Villa-Style Residences and Townhouse Complexes

Gated communities in Egypt often offer a variety of housing typologies that cater to different lifestyles and preferences. Two notable case studies in Egypt that exemplify the architectural character of gated communities are "Katameya Dunes" From East Cairo and "Palm Hills October" from west Cairo.

A. Katameya Dunes:

Katameya Dunes, located in New Cairo, east of Cairo. It is a prestigious gated community known for its luxurious villa-style residences. The architectural design of the villas in Katameya Dunes combines

contemporary and Mediterranean influences, creating a harmonious blend of modern aesthetics and timeless elegance. The villas feature spacious layouts, high-quality finishes, and private outdoor areas, including landscaped gardens and swimming pools. The architectural facades often incorporate elements such as stucco finishes, arched windows, and terracotta roof tiles, evoking a Mediterranean ambiance. The spatial organization within the community emphasizes privacy, with each villa strategically positioned to maximize views and create a sense of exclusivity.

Fig. 6. Katameya Dunes Compound (Source: Google Images)

B. Palm Hills:

Palm Hills October is a gated community located in 6th of October City, west of Cairo. It offers a range of housing typologies, including townhouse complexes. The architectural design of the townhouses in Palm Hills October focuses on creating functional and efficient living spaces while maintaining an appealing aesthetic. The townhouses typically feature multiple levels, with well-designed interiors that maximize space utilization. The exteriors often exhibit a contemporary architectural style, characterized by clean lines, large windows, and façade variations. The spatial organization within the townhouse complexes includes landscaped pathways, communal green spaces, and shared amenities such as swimming pools and playgrounds. The architectural design aims to foster a sense of community and provide a comfortable living environment for residents.

Fig. 7. Palm Hills October Compound (Source: Google Images)

These case studies highlight the diverse architectural characters found in gated communities in Egypt. While Katameya Dunes embodies a Mediterranean-inspired architectural style with its villa residences, Palm Hills October showcases a contemporary approach with its townhouse complexes. Both developments prioritize privacy, functionality, and the integration of green spaces within the community.

These case studies also demonstrate how gated communities in Egypt adapt to the local context and market preferences, offering a blend of international architectural influences and local aesthetics. By incorporating these design elements, gated communities in Egypt create a distinct architectural character that caters to the desires and aspirations of residents seeking a luxurious and secure living environment.

7. FUTURE IMPLICATIONS AND CHALLENGES

A. Sustainability Concerns

As gated communities continue to proliferate, there are growing concerns about their environmental impact. The expansive land use, increased energy consumption, and water-intensive landscaping associated with these developments can have significant ecological consequences. To address these challenges, sustainable design principles and resource management strategies must be integrated into the architectural considerations of gated communities. Emphasizing energy-efficient building practices, incorporating renewable energy sources, implementing water conservation measures, and prioritizing green spaces can help mitigate the environmental footprint of these communities. Furthermore, the use of sustainable materials, waste management systems, and environmentally conscious maintenance practices can contribute to a more sustainable future for gated communities.

B. Social and Economic Inequalities

Gated communities have been criticized for their potential to exacerbate social and economic inequalities. The exclusivity and seclusion offered by these communities can lead to social segregation, limiting interactions and opportunities for social cohesion among residents. Additionally, the high costs associated with living in gated communities may create barriers to entry, further perpetuating socioeconomic disparities. Addressing these challenges requires a multifaceted approach. Developers and urban planners must consider strategies to promote inclusivity, such as incorporating affordable housing options within gated communities or implementing mixed-income housing policies. Furthermore, ensuring equitable access to public services, amenities, and infrastructure for both gated community residents and surrounding neighborhoods is crucial to fostering social integration and reducing inequality.

The integration of gated communities into broader urban planning strategies poses both opportunities and challenges. Gated communities often function as self-contained enclaves, with limited connectivity to the surrounding urban fabric. To promote sustainable urban development, it is essential to foster connectivity and integration between gated communities and the larger urban context. This can be achieved by introducing well-designed pedestrian and cycling networks, improving public transportation options, and creating shared public spaces that encourage interaction between residents of gated communities and the wider community. By adopting these measures, gated communities can contribute to the overall urban fabric in a more meaningful and inclusive way.

Furthermore, urban designers and planners should strive to strike a balance between security and openness. While security is a legitimate concern for gated communities, excessive fortification and the creation of physical barriers may have negative effects on the urban landscape, leading to a fragmented and divided cityscape. Architectural design should aim to create secure environments without sacrificing the visual and physical connections between gated communities and the surrounding areas.

In conclusion, the architectural considerations in gated communities play a significant role in shaping their character and impact on the urban landscape. The design principles, security features, community spaces, and housing typologies adopted in these developments contribute to their overall aesthetic appeal, functionality, and livability. However, future implications and challenges must be addressed to ensure sustainable and inclusive development. By prioritizing sustainability, addressing social and economic inequalities, and integrating gated communities into urban planning strategies, it is possible to create architectural characters that not only provide security and exclusivity but also foster community integration, environmental responsibility, and a sense of belonging for residents and the wider urban population. Through careful planning, collaboration between stakeholders, and a commitment to sustainable and inclusive design practices, the architectural character of gated communities can evolve to meet the needs and aspirations of future generations.

8. CONCLUDING NOTE

Gated communities and compounds have emerged as a new form of housing in Cairo over the last few decades, catering to the changing needs and desires of the city's residents. These communities offer a luxurious and comfortable living experience that traditional apartment buildings cannot provide. However, they also pose several challenges for the city, including their impact on urban development and their effect on the social fabric of Cairo. As the city continues to grow and change, it will be important to consider the impact of these communities on the city and its residents and to develop policies that address the challenges they pose while balancing the benefits they offer.

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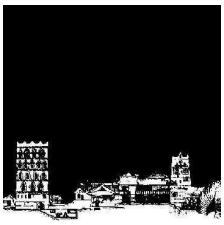
- Case (1): Katameya Heights Golf & Tennis Resort Located 9.15 KM away from The American University in Cairo (AUC), at Gamal Abd El-Nasser and Mohamed Farid Axis, 7.5 KM away from.



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PLANNING AND HOUSING COMMUNITIES

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