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The notion of Ageing in Place & Age Friendly Built Environment in Core Urban area of Lalitpur

by

Shreejana Maharjan

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DEPARTMENT OF ARCHITECTURE

LALITPUR, NEPAL

September, 2022

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DECLARATION

I hereby declare that the thesis entitled "**The notion of Ageing in Place & Age Friendly Built Environment in Core Urban area of Lalitpur**" which is submitted to the Department of Architecture, Pulchowk Campus, Institute of Engineering, Tribhuvan University in partial fulfillment of the requirements for the degree of Masters in Architecture (M.Arch.) is a research work carried out by me, under the supervision of **Asso. Prof. Dr. Ashim Ratna Bajracharya**, between April *2022* to *September 2022*. I declare that the work is my own and has not been submitted for a degree of another University.

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ABSTRACT

This study attempted to access the notion of ageing in place among older individuals; identify the current condition of different imperative domains of age-friendly cities – housing, building, outdoor and neighborhood spaces, transportation, public spaces; and analyze whether the current core urban city is able to promote independent and active ageing amongst the older population. The study employed qualitative research method and descriptive statistics to further analyze the data. The data used in this study were collected from structured questionnaire amongst 112 individuals.

A brief overview of the findings suggests that while the notion of ageing in place is prominent in core urban area of Lalitpur, the current condition of built environment is inadequate to facilitate independence of older population and to enhance both their wellbeing and quality of life. The dwelling form and building structures lacks imperative criteria like access to essential services, access to sunlight and fresh air, mobility within house, access to bedroom, toilet, and kitchen, among others. Likewise, the outdoor and neighborhood spaces in Lalitpur also does not support active ageing as it lacks critical infrastructures like open space, seating areas for social participation and rest, public toilet, and venues for entertainment and community activities. Traffic congestion and lack of access to public transport are also prominent problems.

The difficulties faced by the elderly citizens has direct and adverse impact on both physical and mental wellbeing of the elderly citizens. Given the scenario, Lalitpur city needs to invest heavily in policies as well as infrastructure to make the city age-friendly, which would allow active and independent ageing amongst elderly citizens.

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CHAPTER 1. INTRODUCTION

1.1 Background

All countries around the globe are witnessing a growing concentration of older people. The World Population Prospects 2019 published by United Nations (2019) reported that, for the first time in 2018, there were more people over the age of 65 than children under five.. The World Health Organization (WHO) (2015) reported that by 2025, there will be 1.2 billion people over 60 years of age, and it will increase to 2 billion by 2025. Moreover, the older populations are the fastest growing group, with the concentration of older women being higher than the men. United Nations Department of Economic and Social Affairs (2007) highlighted that the older population in Asia will increase from merely 9 percent in 2006 to 24 percent in 2050 (United Nations Department of Economic and Social Affairs, 2007).

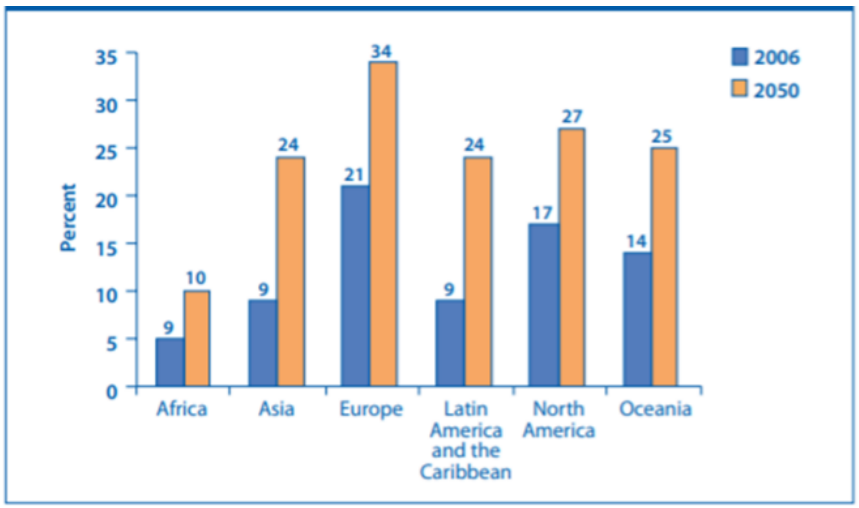


Figure 1.1 Percent distribution of World population 60 or over by region, 2006 and 2050

Source: United Nation Department of Economic and Social Affairs, 2007

The problem of an ageing population is equally relevant in the context of Nepal. The government of Nepal recognizes people above 60 years of age as elderly citizens. According to Ageing Nepal (2018), people belonging to the age group of 60 and above comprises of 8.1 percent of the overall population of Nepal. Figure 1.2 depicts that the number of children under 5 years of age is decreasing, and the ageing population is rapidly rising and the trend is likely to continue. The population monograph of Nepal estimates that the older populations are likely to reach 3.4 million by 2031.

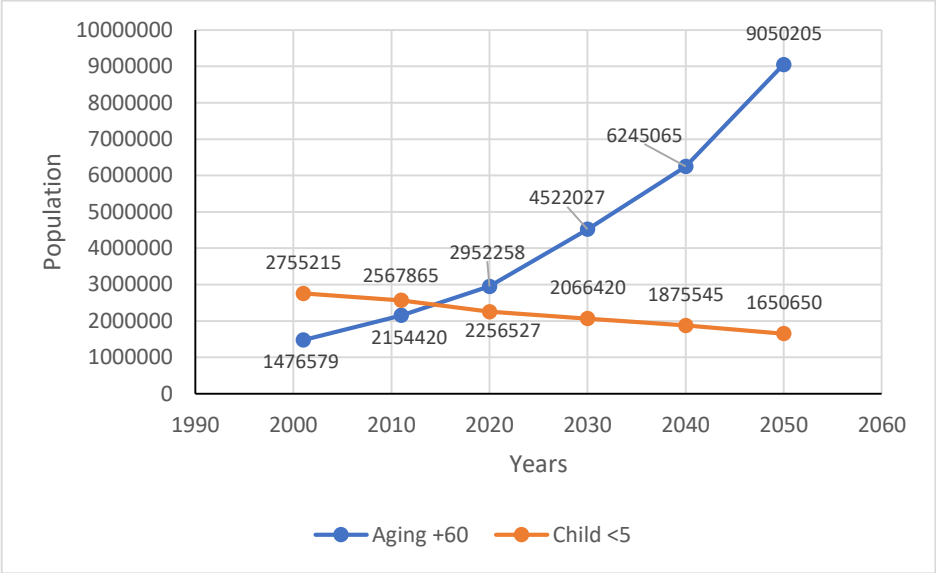


Figure 1.2: Aging population of Nepal (2001 to 2050A.D.)

Source: Ageing Nepal, 2017

Table 1.1 further shows that the projected population aged 60 years or more reached 24.17 thousand in 2016 and it will reach 34.15 thousand in 2031. Similarly, the projected population aged 70 years or more reach 9.58 thousand in 2016 and will reach 14.11 thousand in 2031. It may be due to a decline in mortality, increase life expectancy, and better health facilities (Aryal, 2019).

Table 1.1 Projected elder population of Nepal, 2016-2031

S.N.	Aged	Years			
		2016	2021	2026	2031
1	Projected population aged 60+ years	2417508	2712736	3044017	3415755
2	Projected population aged 65+ years	1593395	1816641	2071166	2361352
3	Projected population aged 70+ years	958994	1090775	1240665	1411152
4	Projected population aged 75+ years	516176	594751	685288	789607

Source: Population Monograph of Nepal Vol. II (Social Demography, 2014)

Many studies around the globe have confirmed that older citizens face a higher number of challenges in both the built environment and social facets of life as ageing compromises their ability to manage everyday life. The decline in physical as well as mental capacity has an adverse impact on the ability of the population to live an independent and active life, substantiating the need of an age-friendly built environment. With regards to the same, numerous studies, as well as organizations around the globe (United Nations, 2019; WHO, 2006; and OECD, 2015), have concentrated their efforts on improving the built environment to make it friendlier for the older population.

According to Karuppannan and Sivam (2013), the built environment can be referred to as man-made spaces, including but not limited to, houses, workplaces, school, library, hospital, care facilities, streets, transportation, and other outdoor spaces. It can be attributed to a variety of structures from the unit, block, and housing to neighborhoods and the city. According to Chau and Jamei (2021), given proper structuring and design of the aforementioned spaces, it can have a significant positive impact on the well-being and quality of life of the older aged population. It has been identified that the built environments have a positive influence on the overall physical and mental health of elders preventing social isolation, signs of depression and loneliness, and the danger of mortality, falls, and hospitalization amongst the old-aged citizens.

A study conducted by Brosius (2020) has identified that healthy ageing in Nepal is challenging as the built environment does not meet the desired requirements essential for the older population. This holds especially true for rapidly growing urban areas like core cities in Kathmandu Valley, where the aging populations have instigated a feeling of insecurity, isolation, and lack of confidence. These groups are prone to become dependent due to fear of living alone in the rapidly transforming environment from traditional to modern. The physical and mental strain of ageing citizens in urban areas is attributable to loss of spatial built environment, congested accessibility, and crowdedness. The need for modern high-rise concrete buildings in small plots, congested roads, encroached courtyards, and vehicle parking in public spaces has hindered the likelihood of active and independent ageing amongst older people (Geriatric Center Nepal, 2010).

UNICEF Nepal Representative, Tomoo Hozumi said that the transition of Nepal from an ageing to an aged society is similar to Japan as Nepal has little time to build adequate facilities for the growing number of old populations (Awale, 2017). This holds especially in the case of rapidly transforming urban cities.

Kathmandu Valley, which consists of three districts – Kathmandu, Bhaktapur, and Lalitpur – has been experiencing urbanization since the early 2000s and currently is regarded as one of the fastest growing metropolitan cities in Asia. Amongst the three cities, Lalitpur is reported to be the oldest city which was founded by King Veer Deva in 299 AD. Its indigenous ethnic group – the Newars – from the early days had influenced fundamental structures of the districts with the local built environment consisting of courtyards with monasteries (bahāl/bahi), temples, patis, open spaces, narrow alleys, larger and smaller shrines, brick and mud mortar houses, among others. Additionally, the classical and social set-up of the city was such that nuclear families were discouraged and people often lived in joint families. The previous physical and social structure of Lalitpur in some ways facilitated active aging given the fact that the elderly populations were looked after by their children and the neighborhood spaces consisted of ample buildings and structures for the elderly people to participate. It uniquely contributed to both the physical and mental well-being of the growing population.

In the past two decades, Lalitpur city has experienced substantial changes in demography, way of living, and built environment. With a decline in birth rate and rapid out-migration of youth, the old people often live alone in their houses. Given the previous societal structure, these people refrain from migrating to old-age homes or areas other than their native land. The structures like open spaces, patis, temples, and other structures have been used for new purposes like parking. Additionally, the 25 April 2015 earthquake not only claimed hundreds of lives in the Valley but also partly or fully demolished many residential buildings displacing family members. This also led to abandoned old family homes by youths, forcing elderly people to stay behind alone.

The city has thus experienced numerous changes and a general observation suggests that the changes have an adverse impact on the older population as criteria for making

the city age-friendly are often neglected or encroached upon while building new structures. This study thus attempts to identify if the notion of ageing in place still exists in the city, and it further aims to analyze the current status of an age-friendly built environment in the city. The major objective is to study the notion of ageing in place & age-friendly built environment for the active ageing population who reside in the core urban area of Lalitpur city.

1.2 Statement of the Problem

The political change of 1951, the ten-year-long Maoist insurgency, and subsequent problems pertaining to unbalanced growth resulted in the migration of a significant number of people scattered across Nepal to Kathmandu Valley. Consequently, the core urban areas of Kathmandu Valley experienced haphazard changes in their built environment. Some of the common problems associated with rapid change were loss of spatial built environment, congested accessibility, and crowdedness. The traditional infrastructures like patis (rest houses), courtyards, and social spaces lost their functional value. With the need for modern high-rise concrete buildings in small plots, the residents experienced congested roads, encroached courtyards, and public spaces being turned into the vehicle parking zone. This meant that the traditional built environment which consisted of social interaction spaces imperative for the older population were being rapidly encroached which led to unhealthy, insecure, and uncomfortable situation for the elderly population.

Additionally, the transition from a traditional joint family to a nuclear family, children moving abroad, and the busy modern lifestyle of a new generation further aggravated the insecurity and loneliness of elderly people. Several studies in Nepal show that the long-established culture and traditions of respecting and supporting elders are eroding day-by-day (Geriatric Center Nepal, 2010). This modification in the cultural norms and traditional family support systems has placed the elderly population under substantial strain (Poudel, 2005).

Despite the rapid changes in the built environment that fails to address the psychological, social, and physical needs of the elderly population, it has been identified that almost 50 percent of the elderly citizen homes in the country have not

been operating (Chitrakar, 2001). This suggests that the elderly citizens of the city continue to live in their respective localities and houses. However, given the plethora challenges for active ageing, the ability of the elderly population to live longer, healthier, safer, and more independent lives has been compromised (Kandel, 2018).

Given the same, it is high time for Nepal to adopt an age-friendly built environment, especially in rapidly urbanizing cities. While organizations like WHO have identified key factors that could contribute to the making of an age-friendly city, it is important to comprehend that different cities require different solutions with respect to their unique structure, culture, behavior, and needs for their populates. While observational findings regarding the deteriorating built-in environment for older citizens are profound in Nepal, research studies that particularly focus on the perception of elderly citizens about their current built environment are unavailable. Likewise, research to scrutinize the reason behind the refrainment of older citizens to move to old-age homes or care centers are also limited. Without a proper understanding of such issues, one cannot design appropriate models and policies that contribute to safe and adaptable built environments for active aging that consists of an appropriate range of services, amenities, and activities that cater to both the physical and mental health of an aging population.

1.3 Rationale of the Research

Aging citizens are the sources of knowledge, skills, experiences, and collections of different ideas in every society or nation. They are the living history of a society. It is very important to utilize their ability, long experiences, and their conscience to reform national socio-economic development and prosperity. As the number of aging people in Nepal increases, its relationships with the built environment should be designed accordingly. With a lifetime of hard work, elder citizens of today deserve dignified care in their aging period, not as a charity from the younger generation but as a right of their own. As everyone has the right to be happy and healthy in his or her later parts of life, the aging people of Nepal should have an architectural built environment with facilities and services to suit their personal needs, capacity, and taste.

There used to be many elder citizen homes and care centers in Nepal but due to inadequate psychological, social, and physical needs of elderly occupants, almost 50 percent of these elder citizen homes and care centers have not been operating (Chitrakar, 2001). As the aging population of Nepal is increasing, there should be safe and adaptable architecture and built environments for active aging people to live happily and healthily. Thus, there is a gap between the relationships with architecture, built environments, and aging people.

The research is important because it attempts to fill the gaps and understand the required built environment of an active ageing group of elders living in the core urban area of Lalitpur. Although internationally there are a vast number of studies, essays, documents, and social research done on the social exclusion of elder citizens, in the context of Nepal, there is no such research done on active aging elders. The review of several international articles and literature indicates that this is relatively an area that has not been given due attention by national researchers. The study emphasizes active aging people's experiences, perceptions, and emotional needs of the architecture and built environment for their healthy and happy lifestyle.

The research findings may assist the policy makers, architects, urban planners, and designers in addressing the physical and psychological needs and demands of an active elder's life due to the present urban core built environment. The findings are also likely to contribute to devising a "coping mechanism" of the built environment for active elders group extended to the similar core urban area in Nepal or other geographical regions with comparable characteristics.

1.4 Research Objectives

The main objective of the research is to study the present built environment of active elders living in the core urban area of the Lalitpur district. The specific objectives of the research are to:

i) Access the notion of ageing in place among older individuals in core urban area of Lalitpur.

ii) Identify the current condition of different imperative domains of age-friendly cities – housing, building, outdoor and neighborhood spaces, transportation, and public spaces – in core urban area of Lalitpur.
iii) Analyze whether the current core urban city can promote independent and active ageing amongst the older population.

1.5 Research Methodology

A research methodology is the philosophical framework within which the research is conducted or the foundation upon which the research is based (Brown, 2006). The choice of research methodology is based on aim of the research, epistemological concerns, norms of practice of the researcher and other precious wok done in that particular topic (Buchanan & Bryman, 2007). It is the overall strategy for the planned research that is connected to the paradigm or theoretical framework that will be used, whereas the method refers to the methodical techniques, methods, or tools used for data collecting and analysis (Mackenzie & Knipe, 2006).

1.5.1 Research Paradigm

A research paradigm is "the set of common beliefs and agreements shared between scientists about how problems should be understood and addressed" (Kuhn, 1962). A scientific paradigm is a framework that includes all of the widely held beliefs about a topic, as well as recognized practices for the direction and conduct of research. The research objectives deals with the present built environment condition at core urban area, which is more subjective, thus come under post positivist paradigm. Post-positivism focuses on analyzing problems in light of the experiences of the majority and publishing the findings of what the majority deems to be acceptable (Wildemuth, 1993). Moreover, research also deals with the active elder's perception, experience, feelings, opinions, social relations, and emotional needs, which is highly interpretivist. Interpretivism is a sociological approach that states it is important to understand or interpret the belief, motives, and actions of individuals in order to understand social reality. Thus, the research come under the pragmatists paradigm. According to the pragmatic paradigm, which is also known as mixed methods design-based research, the

best method is the one that resolves the issue because reality is continually being renegotiated, disputed, and interpreted.

Ontology and the ontological assumptions describe the nature of social reality, its existence, what it looks like, what units make it up, and the way they are related (Blaikie & Priest, 2018). The ontological claim of the research is the world's population is rapidly aging. In the Nepal context, the traditional culture of respecting and supporting elders is eroding leaving the aging people to live alone and vulnerable in an unsafe and unstructured built environment.

Epistemological assumptions are based on the adequacy and legitimacy of different kinds of knowledge that are possible (IBID). This research intends to gain perceptive knowledge about the importance of an active age-friendly built environment for a group of active elders using pragmatic method i.e. using both post positivist and interpretive method. Thus, the research proposed to look into people's minds, perceptions, emotions, since it is the ultimate source of knowledge; about how a built environment plays an important role to fulfill elder's physical and psychological need and demands while designing and planning age-friendly architectural design.

1.5.2 Research Method

The research method is the strategy used to implement the plan that answers research questions (University Libraries, 2018). It is a blueprint that enables the researcher to come up with solutions to research questions and problems, and guide him/her in various stages of research (Nachmias & Nachmias, 1996). The researcher's chances of acquiring data that could be relevant to the real scenario are increased when they organize and carry out their study in a way that helps them achieve the desired findings (Burns & Grove, 2001).

This study has employed qualitative research method to ascertain the notion of ageing in place and to analyze if the current housing and building structures in core urban area of LMC are age friendly. In order to further analyze the qualitative data, this study has used descriptive statistics. It is used in preliminary and exploratory studies to allow researchers to gather information and summarize, present and interpret data for the

purpose of clarification (Burgess, 2003). They are useful for describing, explaining or exploring the existing status of two or more variables (Mugenda & Mugenda, 1999).

The data required for conducting descriptive analysis is collected by using structured survey questionnaire and Key Informant Interviews (KII) and the results are generated by using statistical softwares like Microsoft Excel, and SPSS.

1.5.3 Sample Framing and Sampling

A sample is a representative group based on which a generalization to the 'population' or even a 'universe' may be attempted statistically. This study has used non-probability sampling method for the purpose of sample selection. More specifically, this study has employed purposive sampling technique. For the purposive sample, this study has set three main parameters: (i) active elders, (ii) living alone or with spouse, and (iii) living in core urban area of Lalitpur. The samples were identified with the help of snowball sampling method, whereby the research participants helped recruit additional sample for the study. Thus, the total number of sample size is 112 nos.

1.5.4 Data Collection

The findings of this study are based on both primary and secondary data sources.

For collecting primary data this study used structured questionnaire survey method, interviews, observation guide, and sketching and photograph. The survey was administered physically by visiting the elderly citizens. Likewise, the study undertook interview with 5 key informants.

Questionnaires

According to (Mugenda & Mugenda, 1999) questionnaires give detailed answer to complex problems. Additionally, questionnaires are also a popular method of data collection because of the relative ease and cost-effectiveness with which they are constructed and administered. Questionnaires give a relatively objective data and therefore, are most effective.

This study thus used questionnaires to generate information on the current structure of built-in environment and the perception of elderly population regarding the same.

Majority analysis conducted in this study are based on the data collected from 112 respomdents through the questionnaire.

The questionnaire used in this study were prepared with careful consideration to the limitations of elderly citizens. The wording of the questions, the options provided, ordering the sequence of the questionnaire were thus the most important parts to facilitate the interview. The questionnaire development step included initial structured questionnaire design, consultation with the supervisor, revisions, and further consultations with the experts. Both dichotomous and ordinal scale were used for the questions.

The structured questionnaires were transferred and managed in the KOBO toolbox.

Interview

An interview schedule is a set of questions that the interviewer asks when interviewing the respondent (Mugenda & Mugenda, 1999). An interview is a flexible and adaptable way of finding things out. Interviews generally yield highest cooperation and lowest refusal rates, offers high response quality and it is multi-method data collection which combines questioning, cross examination, and probing techniques (Owens, et al., 2002).

In this study, the key informants were ward chairman, ward members, members of the local club and old age club members of the local guthi, and local leaders. The interview helped to understand the perception of the key personnel on current built environment for elderly population and the problems associated with the same.

Observation

Observation is the process of collecting data directly by seeing, hearing, smelling and testing things as they occur in the real-life situation (Bowen, 2009).

In this study, observation techniques were used to validate the verbal reporting of respondents by comparing them with the actual scenario. The study observed the present built environment as well as other factors that caused misuse and disuse of the built environment such as pollution, congestion, haphazard parking, encroachment, poor maintenance, among others. The study also maintained a schecklist to provide information about the actual condition and behavior.

Sketching and Photograph

The existing maps were studied to understand the position of the built environment. The study also used photographs and sketches of the area to understand the physical changes and the social changes in the built environment of Lalitpur.

Secondary Data

The secondary data were obtained from journals, articles, publications, maps and internet sources, among others. The data explicitly focused on the built environment for active elders and its impact on the quality of life of elders.

Secondary data obtained from available materials and information from books, journals, articles, magazines, newspapers, published literature and records, and websites. Relevant studies and information on age-friendly built environment were studied for refining the findings and generating recommendations of the study.

1.5.5 Data Analysis

This study is based on descriptive analysis of data. The information obtained from the questionnaire were analyzed using Microsoft Excel and SPSS. The findings that consists of explanations of the current built environment are presented in the form of tables, bar diagrams and charts. The obtained findings were compared and further analyzed with the information accumulated through observation guide, interviews, and photographs.

1.6 Scope and Limitations

The scope will extend to both tangible as well as intangible changes in the built environment including their impact on the quality of active elders' life and their well-being. The tangible aspects will include location, function, outdoor space, building, and social spaces while the intangible aspects will include perception, comfort, and pleasure of those spaces. The paper aims to understand and analyze the built environment for active aging and contribute to a healthy quality of life in aging populations, with literature examples from different countries, and questionnaires with active elders, professionals, and relevant persons.

Aging is an incredibly vast field of study and includes biological, behavioral, and sociological aspects. To maintain a brief study relating built environment for the active elderly, only key concepts from gerontology were extracted and measured in terms of their relevance towards improving areas of the built environment for the active aging group. It assumes that the research will pave way for other research in this area.

For this study, the active elder or aging shall define as those individuals between the ages of sixty to seventy-five years old who are free of serious health disorders, and who can actively participate in day-to-day activities including meditation, sports, offices, etc. The research does not include the elders who need constant twenty-four-hour care and medication.

Further, considering the limitation of time and covid pandemic, the research will be limited to the case study area. In addition, the research is limited to the purposive survey, as the total population of the study area is unknown. And further, the research only focuses on active elders living in the core urban area whose adult children or sons live abroad are only considered.

1.7 Conceptual Framework

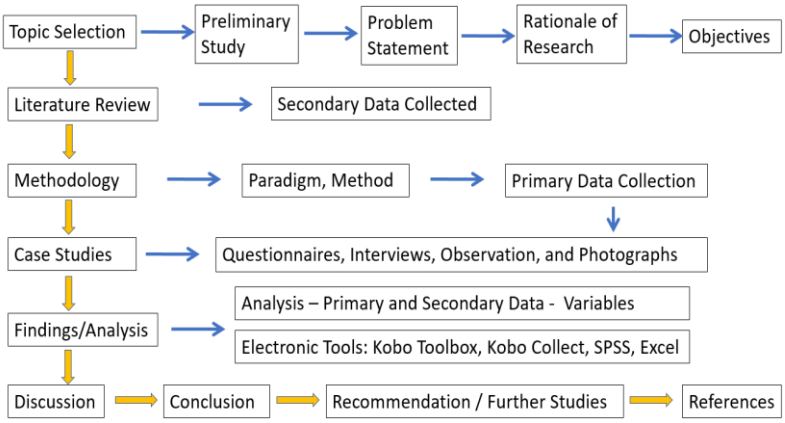


Figure 1.3 Conceptual Framework

CHAPTER 2. LITERATURE REVIEW

2.1 Aging population and importance of planning for elders

The government of Nepal identified people above the age of 60 as older citizens. According to Nepal Law Commission (2008), the senior citizens are classified on the following bases:

- Senior Citizen below seventy years of age
- Senior citizens above seventy years of age
- Helpless senior citizen
- Infirm senior citizen
- Single senior citizen

World Health Organization (WHO) (2015) highlighted that in 2000 there were 600 million people aged 60 and above, which was likely to increase to 1.2 billion by 2025 and to 2 billion by 2050. It further estimated that 75 percent older citizens would be living in developing countries by 2025.

Older population face several challenges attributable to forced retirement, low income, high dependency on others, higher medical costs, loneliness, and deteriorating health conditions that compromises their ability to live a quality life (Kaufman, 1961). A study conducted by O'Hanlon (2019) identified that the major challenges faced by these adults are accessibility to services, barriers to transportation and mobility, inefficient use of land, barrier to communication and public engagement, and inappropriate housing design. Different studies around the globe have suggested that such problems can be mitigated if age-friendly initiatives are conduced with proper planning. It would allow the development of age-friendly communities that can enable older citizens to live in their homes and communities without sacrificing their quality of life and mobility.

Sinclair and Watson (2014) reported that the government, especially local governments, should take measures to ensure that the communities are age-friendly such that it can help older population function easily and can accommodate to the changing need of

people over their lifetime. The report further recognized the need to plan city with greater number of housing and building choices for ageing population at affordable costs, and with significant emphasis on green and open spaces. Likewise, OECD (2015) has also suggested that policies and designs for age-friendly cities should be planned and developed not only considering the present needs and opportunities of ageing population but also by anticipating the future expectation and needs of the people. It highlighted that such planning is plausible given the fact that ageing and their impact on the individual lives and societies are predictable.

Different countries around the globe have thus introduced policy frameworks and designs directed by local authorities that helps meet the needs of elderly citizens of their respective areas. The frameworks are based on demographic trends, market trends, and behavior and needs of the localities. Kent Country Council (2014) identified that countries adopted strategies like assessing housing needs, joint needs of neighborhood, health and social needs, land availability, among others to introduce policies that dictate housing standards, and allocates sites for older people to communicate and socialize. While doing so, local authorities work in tandem with local communities and neighborhod to develop appropriate designs that cater to the needs of the local people.

It is thus imperative to plan cities, communities, architechture, built environment, and policies to help older citizens live in secure and healthy environment. However, findings of Kandel (2018) highlights that no such planning exists in the Nepalese society. It is equally important for nepal to consider active ageing while conducting development planning of its cities.

2.2 Active Ageing and Built Environment

Organizations like WHO have been aggressively working towards building age friendly environment since early 2000s. Some of the initiatives of WHO include ‘Active Ageing: A policy framework’ introduced in 2002 and ‘Global Age Friendly Cities: A guide’ introduced in 2007.

‘Active aging’ is a term advocated by WHO, which simply refers to as healthy and successful ageing. According to Luszcz, et al. (2007), active ageing implies a lifestyle

that helps older population live actively without loss of basic abilities, and which leads to mitigation of vulnerability towards old age diseases and disability. It is based on the principles of independence, security, participation, health, and other aspects in environment that empowers aging population to live actively and independently. It includes different aspects, including but not limited to, biological, psychological, behavioral, economic, social, and environmental. These aspects function throughout the life of an individual and depicts health and wellbeing of the individual during old age (WHO, 2016). Active ageing is considered as a function that is most effective in maintaining quality of life and prosperity amongst older individuals (WHO, 2016). Therefore, communities, policies, architecture, and built environment should be designed and planned to empower active ageing people to live actively.

The built environment in the circumstance specific to the aging group includes housing conditions, neighborhood surroundings, and social connection. Elderly people have a lower tolerance to uncomfortable situations than younger people. The environment affects their working, learning, health, care, and recovery processes and positively reduces errors, accidents, discomfort, and (feelings of) insecurity (Roelofsen, 2013). For those who are aging, age-friendly physical environments can mean the difference between independence and dependence. For example, older people who live in unsafe environments or areas with numerous physical barriers are less likely to get out and are therefore more likely to experience isolation, depression, decreased fitness, and mobility issues. Elderly people are living in their homes and communities but in environments that have not been designed with their needs and capacities in mind (WHO, 2016). Generally, reduced physical activity and social isolation affect the health conditions of aged people. The built environment has a significant role in providing an active lifestyle, happiness, well-being safety, self-reliance, positive social interactions, and physical activity and helps to lower the risk of cardiovascular disease, diabetes, obesity, cognitive decline, alzheimer's /dementia, etc.

The age-friendly built environment includes locations, physical accessibility, service proximity, security, social programs, affordability, and inclusiveness. Such neighborhood and city designs are helpful and meaningful for building the "active

aging" society, which means empowering and engaging the elders in physical, economic, and social activities in their daily life. Some scholars also discuss integrating both the physical and social environment in the process of building age-friendly communities. Thus, a properly designed and maintained built environment encourages regular exercise, reduces crime, creates a safer environment, and reduces pollution inside buildings. Housing satisfaction for healthy aging leads to physical, psychological, and emotional well-being development. The age-friendly built environment helps active aging people to live healthy, productive, and fulfilling lives well into old age. Therefore, creating a built environment that caters to the needs of an aging population where they can be actively involved is important (Shrestha, Karuppannan, & Sivam, 2017).

Building Services: History proves that improvements in the built environment, and in particular the building services reduce illnesses and improve well-being (Roelofsen, 2013). Although good quality food is main, improvements regarding building physics like better natural lighting and ventilation, building services like safe and clean drinking water supplies, electricity, properly closed wastewater, sewerage systems, etc also helps to an improved better life. Essential services are found to be inadequate or very expensive in an existing old-age home.

Lighting: Architects and lighting designers need to take extra care and consideration when designing lighting for elderly people. Since poor lighting can lead to accidents and falls. As people age, they experience vision problems causing everything to appear less vivid and bright. Elders have a whole other idea of what is attractive and functional when it comes to optimal lighting. Elders prefer light sources that are shielded with a shade as it tones down on harsh glare, and they prefer overall ambient light versus dramatic high-contrast lighting. Most importantly, high-quality light is needed throughout the home thus, LED or fluorescent light bulbs are probably best, and large windows are necessary. In general, older people require more light to make their dwellings practical. The walls, ceilings, hallways, and staircases should all be adequately illuminated to ensure clear views and maximum safety.

Color: The colors used within a home can help to improve elders' visibility. High contrast colors help someone with poor eyesight e.g. a darker color on the bathroom walls allows elders to see the white toilet seat or white porcelain sink easily. Color also affects the mood of the people. Elders can become depressed or lonesome as they begin to feel shut-off from the outside world. Soft pinks and greens can help to feel at peace, while red and orange can improve energy levels. Color can greatly increase the joy that elders feel within their homes.

Automation: With the switch to the building, the technique must be reliable only then it is most efficient to deploy for people. New applications must be simple and easy to learn as well as be able to operate naturally. The building automation is to be reliable, matches with each other, best choices, and not unnecessarily expensive.

2.3 The notion of Ageing in Place

While policies related to built environment of aging population are being implemented worldwide, it is recommended that it is of utmost importance to consider the preference of aging population – whether to age in their respective homes and communities or in elder citizen homes (WHO, 2007). The major aim of such initiatives is to ensure active aging through built environment that facilitates to enhance the ability of ageing population to live independently in their houses and communities. Such environment is deemed necessary to enhance the quality of life and wellbeing of adults.

Wiles, et al. (2011) identified that the demographic preferences of ageing population to age in their own homes and communities are widespread throughout the world. The study further revealed that despite deteriorating conditions of mobility, visibility, hearing, cognitive, and mental abilities, older population still desire to continue to live in their own homes and localities. Stones and Gullifer (2016) confirmed to the findings and concluded in their study that ageing in place would allow older adults to live in a familiar setting which could enhance their emotional and mental health. Pani-Harreman (2020) further explained that, older population who have resided in a place for a longer time build a sense of attachment to the locality which make them refrain from migrating to areas with better services for older population. Living in the locality helps preserve

their sense of identity as well as independence. Different studies have established that notion of ageing in place is pervasive in Nepal.

Kathmandu Valley constitutes of specific household conditions, social and cultural relations, kin relations, occupational patterns, festivals, and rituals. In earlier days, a household was usually headed by the grandparents were in a joint family setup. Typical families were composed of four parents, two adults, and one child i.e., 4-2-1 family structure as shown in figure 2.1. The 'classical' set up for elderly people was to live with their son/s, daughter-in-law, and grandchildren.

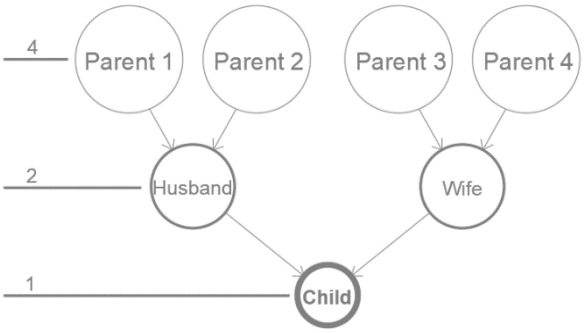


Figure 2.1 Changing Family Structure

Source: (Qian, 2015)

However, with changing demography and pattern of the society, the joint family structure has evolved into a nuclear structure. The pattern shows that the younger generation of the region seek occupations that follow western career and lifestyle models rather than the heritage of their parents and ancestors. Since the end of the Civil War in 2007, and particularly after the 2015 earthquake, many young people have started to seek education and work abroad. Moreover, the younger generation seek to move out of narrow, dark housing, with low ceilings, no access for parking, and no symbols of 'modern living'. The density of the many courtyards and close housing, where families know each other not only because of close daily interaction but also membership to the same caste and ethnic group is now considered 'too close' by many young adults. Their decision to buy land outside, in the periphery of the old town, and to live among members of the 'same class' is often also an attempt to free themselves from such social control.

This has led to abandonment of old family homes by children, leaving elderly population with only two options – reluctantly moving with their children or staying behind. With gradual erosion in family values, changing social structure, and an increasing number of elderlies; many elders choose to stay behind or are forced to live a life of destitute in old age home run by charitable organizations (Report, 2016). It has been reported that many of such active elders choose to live at their original homes and hope to "age in place", which means living in one's original place. In addition, the social perception built through generation discourages these elderly people to move into their daughter and son-in-law's house. Thus, ageing in place with no support system or children is becoming common in Nepal.

However, Lewis and Buffel (2020) highlighted that while ageing in place allows older adults to retain connections with their community, family, and friends, in cities experiencing rapid urbanization, the rapid changes in the environment can be hostile towards older population and thus might create barriers for active ageing. Thus, utmost care should be given while designing the city with due consideration to ageing population. Kennedy, et al. (2016) emphasized on the fact that houses and outdoor spaces that are designed with age-friendly features can help alleviate the need to shift older population to age care facilities and allow them to age independently in their respective places.

2.4 Age-Friendly Cities

The World Health Organization (WHO), in 2002, released a Policy Framework on Active for the purpose of developing and strengthening health and social policies in an ageing world. To address the challenges in an ageing society, the WHO Age-Friendly Environments Program was launched in the mid-2000s (WHO, 2016). With the collaboration of 33 cities from all the continents, WHO produced the "Global Age-friendly Cities: A Guide" in which there are eight domains: housing; transportation; outdoor spaces and public buildings; social participation; community support and health services; respect and social inclusion; civic participation and employment; and communication and information as shown in figure 2.2 below.

Further in 2010, WHO established the Global Network of Age-friendly Cities and Communities to support cities and communities that want to develop age-friendly initiatives (WHO, 2016). The aim is to address the needs of active aging by optimizing opportunities for older adults to maximize their independent living ability and participate in their communities to enhance their quality of life and wellbeing. Age-friendly cities are required to cooperate with urban planners to better adjust public and outdoor spaces, infrastructures, and housing to encourage older adults to spend time outside against isolation or loneliness and to the necessities of aged people.

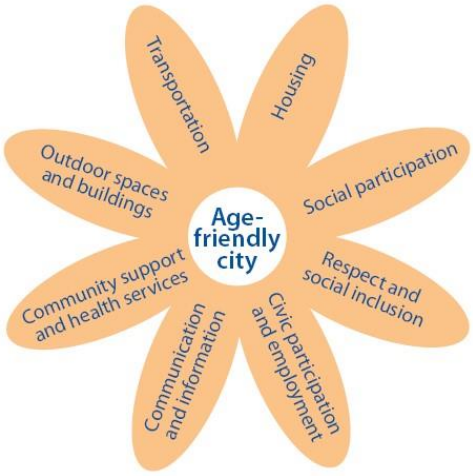


Figure 2.2: Eight domains of Age-friendly Cities

Source: (WHO, 2016)

Chau and Jamei (2021) in their study have identified that the eight domains overlap one another, and three most important age friendly criterion can be developed through the same. The criterion are age-friendly housing and building, age friendly public spaces and neighborhood, and age friendly transportation.

2.4.1 Age-Friendly Housing and Buildings

Inadequate housing and building strucures are considered as the major barrier for active ageing amongst elderly citizens (O'Hanlon, 2019). A study conducted by Luciano, et al. (2020) have considered age-friendly housing as the most important domain because it enables older people to age in place without losing their autonomy and independence.

According to the study, older individuals require specific living arrangements with common characteristics like affordable, small dwelling size, common spaces, medical and recreational facilities, handrails and grab bars, non-slip floors, one-floor layout, and access to ample sunlight and ventilation. Such specific designing requirements thus make housing standards different from those desired by younger adults.

The rationale behind age friendly housing is to enhance accessibility and mobility of elderly citizens inside the house such that they can live independently and comfortably (Sinclair, Silva, & Kopanidi, 2020). According to a study conducted by Kan, et al. (2021), older people spend considerably more time at home compared to other age groups. It provides a familiar physical setting and emotional affinity in terms of personal experiences and memories. Black and Jester (2020) through their study reported that appropriate housing structures significantly correlates with healthy lifestyle and majority of old aged individuals desired for better houses than those with excellent health condition. The factors behind the preference is the mere fact that older population need higher physical and mental support due to their deteriorating health condition.

There is a range of housing options for older people depending on their degree of mobility and levels of impairment, from ordinary houses, apartment units, and retirement housing for independent living, extra care housing with required personal support for assisted living, to residential aged care facilities with nursing care for an institutional living. In this range of housing options, one is the long-term family home and another is the residential aged care facilities for those who are vulnerable with high levels of dependency. Roelofsen (2013) highlighted that, citizes should be able to provide adequate housing options for elderly citizens to live at, like in the case of Netherlands.

Several aspects of housing design are considered to have significant effect on the ability of elderly citizens to live comfortably. In general, age-friendly houses and buildings are built from adequate materials and are structurally sound. It further includes proper floor surfaces; an elevator if it is multi-level accommodation; appropriate bathroom and kitchen facilities; adequate storage space; passages and doorways large enough to

accommodate a wheelchair; and appropriately equipped to meet the ambient environmental conditions. There are various methods to improve the accessibility and adaptability of housing and buildings such as universal design, design for all, inclusive design, and accessible design (Carr, Weir, & Azar, 2013). Generally, the features that are considered necessary for buildings to be age-friendly are (WHO, 2016):

- Elevators
- Escalators
- Ramps
- Wide doorways and passages
- Suitable stairs (not too high or steep) with railings
- Non-slip flooring
- Rest areas with comfortable seating
- Adequate signage
- Public toilets with handicap access.

Numerous organizations like by World Health Organization (2007) and other age-friendly housing guidelines published by Livable Housing Australia (2017), RIBA (2019), among others, have introduced a criterion for age friendly housing.

According to 'Global Age Friendly Cities: A guide' published by WHO (2007), the requirements for age friendly housing and building includes:

- Affordability
- Connectivity to essential services
- Design that includes sufficient space for free movement, appropriate heating and other environmental conditions, wide passages, and appropriately designed bathrooms, toilets and kitchen, among others.
- Affordable modifications
- Affordable maintenance.

Likewise, some of the aspects considered as imperative by the Livable Housing Australia (2017) are as follows:

- Access to dwelling

- Step free path of travel from the street entrance and / or parking area to a dwelling entrance
- Comfortable and unimpeded movement between spaces
- Easy access to toilet
- Safe mobility within the house
- Ground level bedroom space
- Secure flooring
- Size and location of window
- Ease of mobility in staircase to avoid injuries, among others.

Likewise, Senior Citizens Rules particularly designed for age care homes, give higher emphasis on ventilation and sunlight (Nepal Law Comission, 2008). Minimum infrastructure and facilities supposed to be available (Relating to sub-rule (1) and (2) of Rule 12 of Senior Citizen Rules, 2008) in the care centre and daytime service center hosting to senior citizen are:

- Arrangement of room with at least forty sq.ft. of surface for each senior citizen
- There should be a Senior Citizen Friendship Building and the area of compound of the building should be at least two times more than the area of coverage of building
- Arrangement of separate rooms for the male and female except in the case of senior citizens staying together as husband and wife to each other
- The following facilities:
    - At least two toilets (separate for male and female)
    - At least two bathrooms (separate for male and female)
    - Kitchen/store room
    - Dining hall
    - Study room/T.V. room
    - First Aid room
    - Waiting room
    - Library/reading room

    - Any one playing spot among gymnasium, swimming pool and open ground
- Arrangement of pure drinking water
- Sufficient windows for ventilation and light in the rooms of the building
- Arrangement of cook and waiter, cleaner and necessary staff, and necessary medical person for health checkup and care of senior citizens, and necessary arrangement for training and lecture also from time to time
- Special arrangement for accommodation of an infirm senior citizen suffered from a long disease, communicative disease (by giving due consideration to such disease).

Some of the common attributes in these houses and buildings that are compatible for Nepal are easy access to dwelling, easy access to daily activities, easy access to kitchen and toilet, easy staircase mobility, and ample access to light and ventilation.

2.4.2 Age-Friendly Outdoor or Neighborhood Spaces

Age-friendly public and outdoor spaces includes efficient access to social support and facilities within the neighborhood of the elderly citizens that helps enhance their quality of life and wellbeing. Older citizens often feel lonely as well as depressed, especially those who are single (Savikko et al., 2005). Adequate and age-friendly public and neighborhood spaces helps elderly citizens feel comfortable to spend time outside their houses and interact with the neighbors that will enhance their mental health. It helps in promoting voluntary social interaction and helps elderly citizens to engage in their community and build social ties with the same to cope up with feelings of isolation and loneliness (Alidoust, Bosman, & Holden, 2018).

Several studies have identified key components of neighborhood spaces that is deemed imperative for ageing population. A study conducted by Sallis (2009) highlighted the need for open spaces to conduct physical activity in the neighbordood. The study identified that regular outdoor physical activity is directly correlated with healthy lifestyle of elderly citizens. Likewise, walking is also considered as a key physical

outdoor activity (Borst et al., 2009). However, in order to ensure that older adults enagage in walking activities in their neighborhood, it is important for the neighborhood to be easily walkable. Walkability is thus a key aspect of age-friendly outdoor space. In addition to adequate open space for physical exercise and walkability, another study conducted by Crowe (2013) also mentioned that user-friendly street furniture and inclusive design which includes seating spaces for older adults, appropriate public toilets, and other such facilities are also equally important for older adults to feel comfortable in spending time at their neighborhood. Likewise, the governments also need to ensure that the public spaces are free from crime and violence and has adequate space for natural calamities.

Atlanta Regional Commission (2009) published a handbook on 'Lifelong Communities Handbook: Creating Opportunities for Lifelong Living' that provided principles of lifelong communities that are age-friendly. The principles include:

- Diversity in types of dwelling
- Pedestrian access(walkability)
- Connectivity
- Social interaction
- Neighborhood services
- Consideration for existing residents, and
- Healthy living

Likewise, the guideline provided by WHO (2007) includes:

- Clean environment
- Green spaces and walkways that are free from obstructions and have smooth surface
- Outdoor seating spaces at regular interviews
- Public safety at all open spaces
- Open spaces to reduce risk from disasters
- Public toilets that are clean, -maintained and easily accessible by all.

2.4.3 Age-Friendly Transportation

Age friendly transportation refers to the affordability, accessibility as well as availability of safe and reliable transport facilities. Transportation is an integral part of human life that allows easy mobility that enhances access to basic services and social participation (Friman, Lättman, & Olsson, 2020). The perceived safety, quality and accessibility of public transport by elder citizens determine their willingness to travel outside their houses. A study conducted by Green, Jones, and Roberts (2014) identified that easy access to transportation services provides opportunities for older citizens to interact with other members and enhance their social life and reduce social exclusion.

In addition to safe and accessible transport, walkability within the periphery of the neighborhood also plays an important role for older adults to access day to day services and interact with immediate neighbors and community members. Additionally, for older adults who do not live in close vicinity that provides easy access to public transport, private vehicle ownership is deemed as necessary and important. However, Anstey et al. (2005) suggested that given the deteriorating condition of senses, physical abilities, and cognitive abilities, elderly citizens can be prone to driving risks. Thus it is more plausible to design proper public transport systems in such areas.

The checklist provided by WHO (2007) for age-friendly transport includes:

- Affordability
- Frequency of availability
- Transport service for all travel destinations
- Age friendly vehicles with priority seating and other services and infrastrucutre
- Well maintained roads
- Adequate and affordable parking spaces

2.4.4 Age-Friendly Social Participation, Community Support and Health Services

Social participation, community support and health services are highly valuable attributes during old age. A study conducted by Aroogh and Shahboulaghi (2020) found that for active ageing, age friendly communities need to pay higher emphasis on

different community-based activities as well as interpersonal interactions. The community should also be indulged in resource sharing and support to one another. Another study identified that given low level of social participation in community activities, the elderly citizens are at higher risk of mortality and social isolation (Gough et al., 2021)

According to the Senior Citizens Rules 2008, the day care centers or old age homes with more than five senior citizens should have at least the following minimum infrastructure and facilities in addition to the other facilities:

- Gymnasium, swimming pool, playing ground or any type of recreation spot
- Toilet
- Library, reading room or waiting hall
- First aid center
- First aid medical person

Likewise, WHO (2007) has included the following criteria for cities to enhance social participation and health services for elderly population:

- Accessibility to events and activities
- Variety of activities to engage diverse group of older population
- Accessibility to facilities and service centers
- Accessibility to health services, old age homes and day care centers

Old age homes and day care centers are also equally important to mitigate problems of social isolation amongst adults. However, old-age homes in Nepal are a recent phenomenon, even though the concept of the 'abode for the aged' (Briddhashram) is part of the culture of aging in Asia as a confined religious charity, service (Seva), and organization. The non-contributory, community-based old-age homes have been rising since the 1990s. However, since the early 2000s; many private care homes have been emerging inside the urban core of Kathmandu Valley.

Internationally, it shows that elder homes have cheaper costs and a safer living environment. There are more social opportunities than in normal homes the elderly live (Portacolone & Halpern, 2014). If the government elder institutions of concerned

country subsidies affordable living for the elderly then it will save expenses for the elders who live at home with the same living conditions. However, this may not be the case for private elder homes because the whole costs for the operation of private homes are mostly from the owners and the elderly. For the safety aspect, the close-gated elder homes help guarantee the elimination of outsiders' crimes. Healthcare resources and electronic instant reporting facilities connected to central control systems make the elders easier to deal with emergencies. Living in a elder home is relaxed with an active atmosphere created through different organized activities for different elderly getting along and interacting with each other. Thus, international elders decide to move to elder homes due to various social, economic, and individual preferences.

Followings are some of the old aged homes developed and developing in Nepal: Pashupati Briddhaashram at Pashupati, Swastha Sewa Tatha Shanti Ashram at Shankhamul, Buddha Briddhaashram in Banepa, Bishanti Mandir in Dhankuta, Nishahaya Shewa Shadan in New Baneshwar, Deughat Briddaashram in Deughat, Dhamma Bash Briddhaashram in Khushibu, Tapasthali Briddaashram in Chapali, Janaki Briddhaashram in Janakpur, Briddha Mahila Niwash in Pokhara, Shanti Ashram in Khokana, Joti Briddha Mahila Ashram in Thankot, Nepal Matatirtha Briddhaashram in Matatirtha, Bhasha Misha Puchha Ashram in Swayambhu, Ananda Ashram Cooperative in Kathmandu and an Elderly Citizens' Home in Godawari, etc. Of the above-mentioned old-aged homes, almost 50 percent have not been operating (Chitrakar, 2001).

One of the unique, public, dynamic, and multiple uses spaces in Kathmandu is resthouses or pati. It is a ritual site, a site for everyday gatherings and leisure spaces mainly of elder people and children. Similarly, the WHO report on age-friendly housing and buildings highlights the importance of rest places to relax, recharge, and socialize. Health club, day club, libraries, recreational programs, and educational activities provide older adults with an opportunity to meet friends socialize and spend time in settings outside their homes. Parks and green spaces provide older adults with opportunities to socialize and keep them engaged in the company of others. This provides a sense of place identity and familiarity for an older adult, forging a deeper

sense of connection to the community and a feeling of 'growing old together. These spaces offered opportunity for spontaneous chats and unexpected meetings with friends and neighbors, which led to opportunities for social support and encouraged socialites.

2.5 Urban Space

Urban spaces are those outdoor spaces that are among the buildings that allow communication, transit and social interaction of the inhabitants within the urban area. Urban space is the main tool of integrating within a city. Urban spaces are share by the city-dwellers, external travelers and various users, it consists the activities taken place and interwoven nature of activity patterns and serve as the setting in which they transmit and relearn cultural accumulation. The urban spaces is the area where the inhabitants perform important activities of their daily lives like gathering, playing, eating, fitness along with other activities like buying, selling, etc. And occasionally it is the space for religious and cultural purposes during festivals and jatras. They provide environmental, health, and social services to the elders residents of the city. However, open spaces form is changing along with the change in conception of neighborhood due to the globalization and urbanization processes. These spaces provide social psychological services that are critical to the well-being of the urbanities and livability of the city.

2.5.1 Square

Square are produce by the groupings of houses around an open space. This arrangement provided a high degree of internal space for daily activities. The square also provides spaces for interaction or socialized spaces for elders. There are many small and big courtyard like the temple courtyards, baha (Buddhist courtyard), the residential courtyard, the inner courtyard, neighborhood square, etc. The inner courtyard or atrium corresponds to this in the private sphere. The courtyard house is the oldest type of town house. In spite of its undisputed advantages, the courtyard house now discredited especially because of people's preference of nuclear family instead of extended family.

2.5.2 Phalcas, Patis, Resthouse

Phalcas, Patis, Resthouse are places that are semi-public and religiously or ritually used. The rest house is also a social space for everyday gatherings, mainly of elderly people and children. With a few exceptions, the new generation does not seem to be interested in the relevance of these spaces and many people are not familiar with them, especially if they are from outside the valley. Even the communities located around these open spaces do not cherish this institution any longer and allow it to be encroached, privatized or dismantled. This way, this age-friendly social and ritual gathering site, where leisure and ritual merge, gradually disappears.

2.5.3 Transformation of urban space

In recent years urban environment have changed significantly, as have the ideas on how to design, change and improve them along with an influence by the use of technologies. Increased in mobility both physical and electronic has reduced the need for the spatial concentration of activities and enabling the spread of activities. Traditional centralized mode of city form has changed into a landscape of sprawling polycentric cities.

2.6 International Case Review

2.6.1 A sociological study of Old persons residing in an Old age Home of Delhi, India

This paper based on the various demands of old citizens from Bindapur old age home of Delhi. As the modernization effected the people of India, the tradition of joint family society is disappearing with believing in “Nuclear family”. And because of loneliness as a main reason, the older people shifted to the old age home. The study shows that combined or joint family is very helpful in care of old peoples compare to the nuclear family. In addition, 25% of respondents who were dwelling in an old age home came because they lacked sons, and 30% of them said they had no one to care for them. The health of the women residing in the old age homes was not very good, but they had nowhere else to go.

The study reflects that old age is that period of time when a human being needs someone to interact with and someone to share his/her feelings with. The government should be concerned about elders' health and helpful programs should be developed. The problem of level 1and 2 from the Maslow's hierarchy of needs could not be fulfilled until the essential needs of older people-for food, shelter, security and access to health care-are not met. The nations must create an environment where older people have right to live in dignity-free of abuse and exploitation-and are given opportunities to participate fully in educational, cultural and economic activities (Lalan, 2014).

2.6.2 Neighborhood Support for Active Ageing in Urban India

The paper contributes to the knowledge for delivering age-friendly cities and communities that helps to shape active ageing in urban India. The findings explore three themes: (a) neighborhood design for active ageing, (b) social participation in community spaces and (c) navigating urban transport and mobility. The study emphasizes that access to neighborhood amenities such as parks and green spaces, transportation, and chances for leisure and social interaction have a crucial role in determining older adults' health and quality of life. The study also informs policy efforts to improve neighborhood supports for active ageing in urban India.

The study shows the needs of neighborhood walkability, pedestrian safety, access to parks and community spaces for physical activity and social interaction, maintenance of public spaces and enforcement of traffic laws. There should be connection between indoor and outdoor built environment for building social connections. Neighborhood parks and open spaces encouraged older folks to leave their homes and engage in unprompted conversations and chance to contacts with friends and neighbors, which opened up opportunities for social support and community building. Notably, parks and green spaces played a significant part in the lives of older adults as due to population access to natural habitats is restricted in large urban cities. Several studies have documented older adults' use of neighborhood open spaces and parks linked to improved health outcomes, sense of community and reduced stress levels (Schmidt,, Kerr, & Schipperijn, 2019).

Neighborhood amenities such as libraries, community centers, and community-based cultural programs provide indispensable opportunities for social participation and community engagement. Studies shows the positive impact of community events, participatory art and music programs, and the overall social environment on the health and well-being of older adults. It is important as frequency of social participation reduces losses in health, social or financial resources.

Extensive amount of research has examined the relationship between neighborhood walkability (e.g. connectivity, land-use mix and population density), active living and health. However, altering is difficult to implement in existing urban neighborhood settings. On the contrary, re-designing and changing neighborhood design, for example, (a) the addition of public facilities such as toilets, rest stops along walking paths, (b) street furniture such as benches and seating, and (c) safe pedestrian environments with footpaths, tactile paving, streetlights, crossing signals, curb cuts and signage are relatively cost-effective and efficient methods to create built environments that are conducive to older adults' mobility needs. These changes are important in India's metropolitan areas, where neighborhoods are frequently packed, have poor street layouts, little in the way of infrastructure for pedestrians, and heavily rely on private motorized vehicles. Urban planning in India discourages people from walking on the sidewalks and in public areas. This could limit older persons' outside activity, keep them inside, and promote social isolation and sedentary lifestyles.

These factors are particularly imperative for older adults with cognitive limitations. For example, the character of street networks, types of landmarks and features that make an area legible can affect the ability of older adults with dementia to recognize and navigate their local urban neighborhoods (Mitchell, Burton, & Raman, 2004). A greater focus is needed on interventions that encourage older adults' social connections and engagement. For example, community hubs that can provide a central access point for a range of sociocultural and recreational programs and services (e.g., public libraries and community centers) can be promising interventions to address the social needs of older adults, foster independence and nurture a sense of purpose and belonging to a community. The requirements of older persons for mobility, freedom, and social

connection in later life must be actively protected and promoted by urban planning strategies that make cities inclusive, warm, and friendly environments. (Adlakha, Krishna, Woolrych, & Ellis, 2020).

2.6.3 The impact of neighborhood environments on quality of life of elderly people: Evidence from Nanjing, China

The connections between the built environment and quality of life are major concerns in the fields of geography and urban planning. However, the relationship between neighborhood environments and the quality of life of the elderly has scarcely researched. Thus, this article promotes the life satisfaction of elderly people in urban China. For investigate the residential built environment and quality of life of the elderly in China, the theoretical model created. Perceptions of the built environment, which includes three aspects – accessibility, the walking environment and communication spaces; represent cognitive responses to neighborhood features. The three perceptions influence satisfaction with a life domain (including four parts: satisfaction with health conditions, residential environment, transport and social interaction), which in turn contributes to global life satisfaction. Generally, there are two preconditions to give the elderly a positive perception of communication spaces: one is having places and activities nearby for communicating, and the other is having easy access to these places and activities.

However, from study, among the four life domains, the impact of residential satisfaction is the largest, whereas that of social interaction is the smallest. The studies have indicated that quality of life divided into two levels, encompassing the personal quality of life and the interpersonal quality of life. Generally, the personal quality of life represents the basic life needs, including health, shelter and mobility, while the interpersonal one concerns the higher life needs, such as social and educational domains. The results indicate that the elderly in China currently put higher emphasis on basic needs than higher life needs. For policy makers, it is important to understand the level of quality of life because they could regulate the current life decisions of the elderly and seek their higher needs from a dynamic viewpoint.

For older people in urban China, several factors of built environment, such as proper interior conditions of housing, high standards of facilities and physical environment, strong social interactions with coworkers and neighbors and high accessibility to facilities, may largely improve their quality of life (Feng, Tang, & Chuai, 2017).

2.6.4 Recreational Activities for Senior Citizens

Recreation plays a key role in the well-being of older adults and in enhancing their quality of life. The important benefits of recreation for the elder population is increased health and fitness, as well as opportunities for socializing, for using skills and talents developed throughout their lifetime, and for learning new skills. The aim of this article is to dwell upon various recreational activities for the elderly. These activities are very useful to them as they can spend their leisure time and enjoy by doing interesting tasks. The elderly population may be diverse, with a range of hobbies, talents, and skills. Some people made good use of their leisure time throughout their lives and were able to choose activities that suited their shifting interests and physical capabilities. However, other senior citizens might not be aware of the possible advantages of recreation.

There are many recreational activities for elders that provide long term advantages. Higher fitness levels, improved health and social interactions are few of the benefits of indulging in fun activities. It provides therapeutic refreshment for both: the mind and body. Like: walking, bird watching, photography, gardening, sports, exercise, yoga, art, indoor activities, outdoor, activities, etc.

Researches shows that elderly‘s with active lifestyles are often as healthy as less active people aged 15 years younger. One of the best ways of living a long and healthy life is through physical exercise. Regular physical activity helps reduce the effects of aging such as muscle strength, balance, limited mobility and flexibility. It also reduces the risk of osteoporosis and heart problems, as well as keeping older adults in a happy and healthy frame of mind. All these activities play an important role in ensuring their look and feel younger, healthier, and have a better quality of life (Singh & Kiran, 2014).

2.6.5 Determinants of quality of life amongst older people in deprived neighborhoods

The article analyses the determinants of the quality of older people in deprived urban areas of three English cities and the measurement of quality of life. The study shows that individuals' perception of their own health, perceived ability to manage financially, perception of poverty over time and feelings of loneliness were important determinants of the quality of life of people aged 60 and more years across the three measures. The environmental factors: fear of crime, and satisfaction with neighborhood play an important role in older people's quality of life. The high rates of reported crime, a widespread fear of crime, and concern about a range of other social problems would directly affect individuals' quality of life. It turned out, however, that only satisfaction with neighborhood and being a victim of crime were significant predictors. The results shows that the effect of the environmental variables on quality of life may have been mediated through other variables, such as individual perception of health and perceived ability to manage financially.

For measurement of quality of life, four important determinants were identified: perception of health, perception of managing financially, perception of poverty over time and loneliness. The result shows that each instrument represents similar constructs of wellbeing (Smith, Sim, Scharf, & Phillipson, 2004).

2.6.6 'Ageing in Place'? Exploring Elderly People's Housing Preferences

This study was conducted by Costa-Font, Elvira, & Mascarilla-Miró (2007) with the objective to empirically examine the reason behind older people prefering to age in place, and to find out about their housing preferenves, and willingness to make changes in houses to enable independent ageing. The results of this study were derived from data collected through structured questionnaire of 729 individuals which were analyzed through desciptive statistics.

The findings revealed that 78 percent older individuals preferred to age in place, and the notion became more prominent with increasing age. For instance, 85 percent individuals above the age of 80 preffered to age in place. It also identified that older

individuals do not want to live in institutional care facilities or make structural improvement to their houses as they became older. One of the major reason behind the same was the increased cost of home modifications. The study further highlighted that affluent and highly disabled individuals preferred to move to improved housing conditions or care facilities. However, women and people with less formal education, and low income, preferred to live in their own house without significant modifications.

The study also revealed that ageing in place was not possible until and unless it was accompanied by services by government and community to support them in old age. Thus, the housing standards, and built environment of a city needs to be tailored according to the needs of elderly citizens.

2.7 Fundamental Parameters

Based on the physical and psychological need of elderly citizens as highlighted by WHO (2007), this study has aimed to study some fundamental parameters of age friendly cities in the core urban area of Lalitpur. The study is mostly inspired by "Global Age-friendly Cities: A Guide" published by WHO, which provides eight domains of age friendly cities. The domains are housing; outdoor spaces and public buildings; social participation; transportation; community support and health services; respect and social inclusion; civic participation and employment; communication and information. The fundamental parameters studied in this research paper comprises of five domain as shown in figure 2.3 below, which has also been conducted by studies of Chau and Jamei (2021).

The five domains mostly emphasis on the architectural parameters only like housing, buildings, outdoor resting spaces, neighborhood built spaces, transportation built spaces, social participation built spaces, community buildings, and health building spaces within elders neighborhood living spaces. These five fundamental parameters of the study helps elders to stimulate independent and active ageing amongst the older population.

The fundamental parameters of the study are as follows:

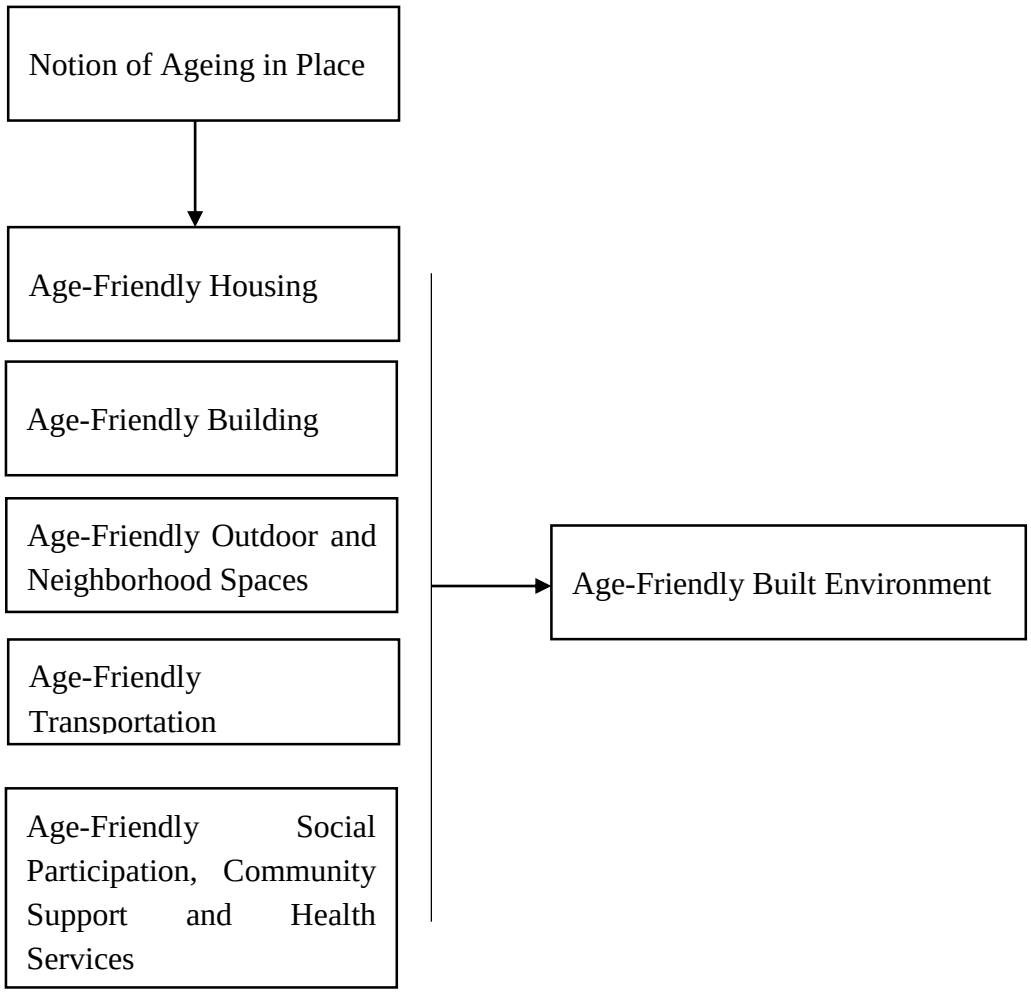


Figure 2.3 Fundamental Parameters of Study

Source: WHO (2007)

2.8 Variables and their Factors

Table 2.1 Variables and their Factors

S.N	Variables		Factors
1	Notion of Ageing in Place	1.1	Length of residency
		1.2	Satisfaction towards building and neighborhood
		1.3	Attachment to the locality
		1.4	Plans of migrating
2	Age-Friendly Housing	2.1	Dwelling zones
		2.2	Dwelling form
		2.3	Type of dwelling
		2.4	Access to dwelling
		2.5	Connectivity to essential services
		2.7	Safety of building material
3	Age-Friendly Building	3.1	Number of stories in the building
		3.2	Number of rooms used
		3.3	Access to bedroom
		3.4	Access to kitchen
		3.5	Access to toilet
		3.6	Staircase mobility
		3.7	Access to light and ventilation
4	Age-Friendly Outdoor and Neighborhood Spaces	4.1	Public open spaces
		4.2	Open spaces for daily exercise
		4.3	Public outdoor seating space
		4.4	Public toilet
		4.5	Evacuation spaces for natural calamities
		4.6	Ease of walkability
5	Age Friendly Transportation	5.1	Mode of transportation
		5.2	Vehicles movement in neighborhood
		5.3	Ease of access to public transport
		5.4	Parking
6	Age Friendly Social Participation, Community Support, and Health Services	6.1	Care and ageing well services
		6.2	Day club spaces
		6.3	Community building
		6.4	Desired modifications

CHAPTER 3. CASE STUDIES

3.1 Study Area

The Kathmandu Valley made of three capitals: Kathmandu, Bhaktapur, and Lalitpur. Lalitpur located within the south-central part of Kathmandu Valley. Many legends claim that it was found by King Veer Deva in 299 AD and it is the oldest of all the cities of Kathmandu Valley. Buddhist legends narrate that the town was initially form with plan of Dharma Chakra, the Buddhist Wheel by the Mauryan Emperor Ashoka. The four thurs or mounds located on the perimeter of Patan credited to him through his name of Ashoka Stupas. The main arterial streets of Patan link the two pairs of stupas (east-west and north-south) and intersect at Patan Durbar square, the city core of Lalitpur echoing the Dharma chakra layout (Tiwari, 2007).

The study will start from the core urban area of Lalitpur; Patan Durbar Square periphery. As the study will conducted on snowball sample method with main focus on three main aspects; built environment of urban core area of Lalitpur, active elders between 60 – 75yrs, , and who live alone or with spouse; no adult supervision. The study area has a local indigenous Newars group influenced by both Buddhism and Hinduism with densely compact planned buildings with multiple built environment like temples, patis, well, courtyard, and common open space at intervals.

Nepal Map

Kathmandu Valley Map

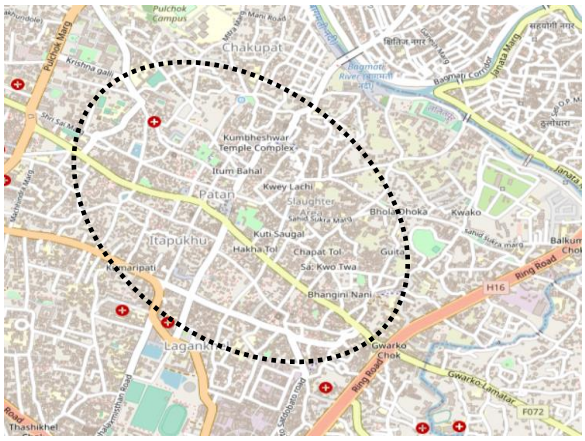


Figure 3.1: Map of Study Area; Lalitpur

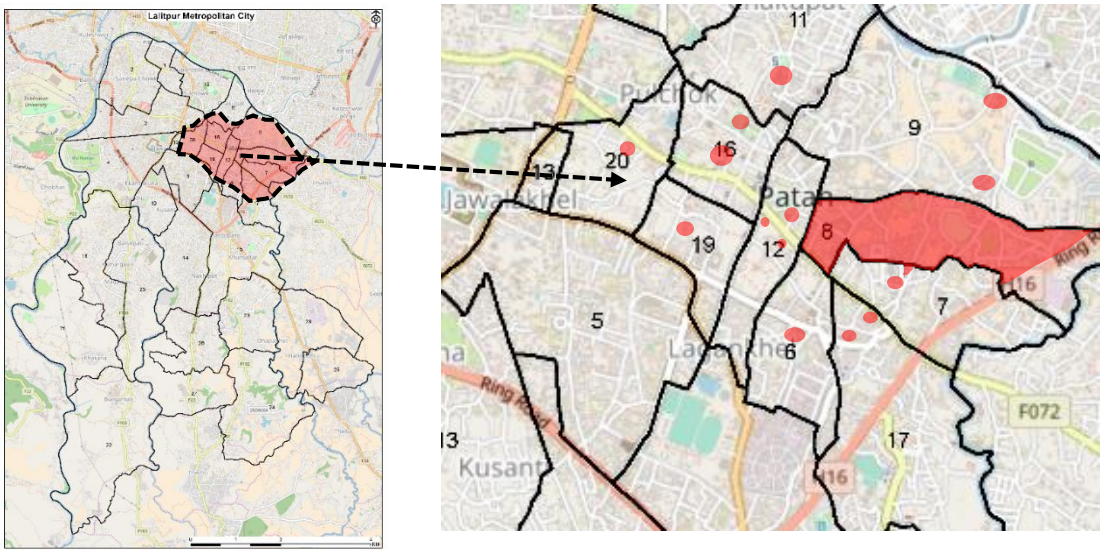


Figure 3.2 Blow up – Study Area

Table 3.1 Study Area with ward number and number of respondent

Ward Number	Area Name	No. of Respondent
6	Kanibahal, Gusibahal	3
7	Pinche, Pilache	7
8	Shako, Guetole, Chapat, Yalamula, Subahal, Dupat, Lonlha	55
9	Balkumari, Sankhamul	7
11	Kumbeswor	2

12	Hakkha, Thaina, Saugal	6
17	Lukhusi, Tyagal	11
16	Nagbahal, Dhougal, Dhalacho, Doubahal, Gabahal	13
19	Agnisar, Agnimath	4
20	Purnachandi	4
	TOTAL	**112**

3.2 Old-age Day Care Center

While conducting the study four old age day care center found inside different part of the core area of Lalitpur. They are as follows:

- Mikhabaha Jestha Nagarik Sewa Sadan, Patan Dhoka
- Hiranya Day Care Center, Golden Temple
- Talache Jestha Nagarik Samuha, Talache
- Jestha Nagarik Kendra, Balkumari

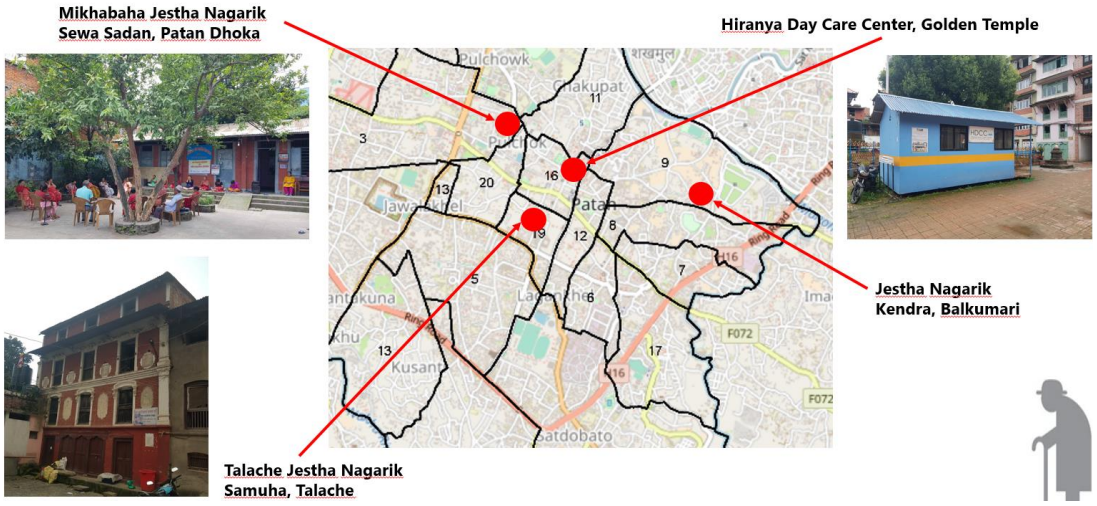


Figure 3.3 Old age day care center – Location

Among all of the above day care center only the first one “Mikhabaha Jestha Nagarik Sewa Sadan, Patan Dhoka” operating. The others center were closed due to COVID-19 and while conducting the survey many elders were eagerly waiting to open the day care center so that they can continue their visit to that places.

“Mikhabaha Jestha Nagarik Sewa Sadan, Patan Dhoka” serve a hygienic lunch for the elders along with the interacting spaces with social functions like yoga, bhajan, songs, picnic, etc. The opening time schedule is from 10am to 4pm, Sunday to Friday. But the supervisor of the place reported that the elder requested to open it on Saturday too.

3.3 Jyapu Samaj Jestha Nagarik Ananda Niketan, Bagdol, Lalipur

Jestha Nagarik Ananda Niketan – a residential care for senior citizens located at Bagdol, Lalitpur built to serve the growing needs of aging population in Nepal. With increasing youth out-migration and various socio-economic reasons, the life of elderly parents are distress. The main objectives of this institution is to care and provides their right to live a dignified life. The other objectives of the institution is to provide quality healthcare including communal activities for mental and physical well-being in affiliation with Star Hospital, Sanepa.

The institution located at peaceful, pollution-free area with jungles and greenery of historical Chovar gorge and panoramic view of the Himalayan range from the terrace. The total built-up area of the institution is 21,774 sq.ft. The institution can accommodates 110 elder’s residential facility with auditoriums for praying, learning hall, library, yoga, and exercise hall. The institution also provide other facilities or amenities like; ramp access up to first floor, well-equipped medical poly clinic service, 24/7 nursing availability, lift, laundry service, kitchen, dining, and wheelchair-friendly restrooms. Figure 3.4 shows the front view of the Jestha Nagarik Ananda Niketan building. Figure 3.5 is the ramp inside the building up to the first floor, only the ground floor and first floor are connected with the ramp and for the other floors, wheelchair access is through the lift. There are male dormitories, female dormitories, and single or twin-bedroom units as per the elder's requirements. Figure 3.7 shows the internal layout of the typical twin bedroom with an attached toilet.

Figure 3.4 Front View

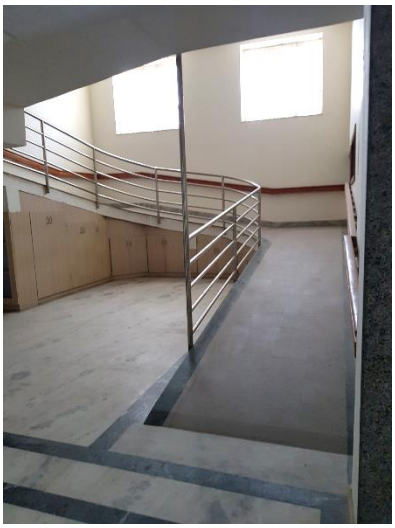


Figure 3.5 Internal Ramp

Figure 3.6 Polyclinic

Figure 3.7 Twin bed room with attached toilet

Figure 3.8 Lift

Figure 3.9 Lobby Area

3.4 Demographic Characteristics of the Respondents

3.4.1 Age

All respondents in this study were older than 60 years of age. Majority of respondents (55percent) belonged to the age group between 60 and 65. Likewise, 21 percent were aged between 66 to 70 years of age and the remaining 23 percent were aged between 71 to 75 years of age.

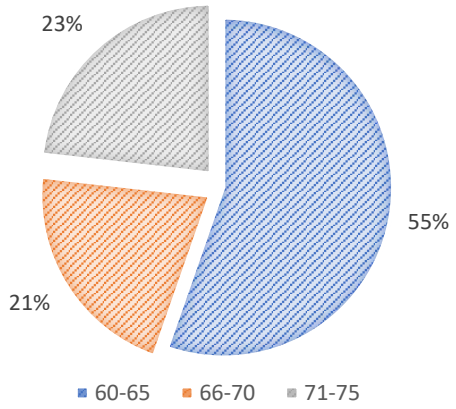


Figure 3.10 Respondent Age

3.4.2 Gender

Amongst the total number of respondents in the study, 57 percent were female and 43 percent were male.

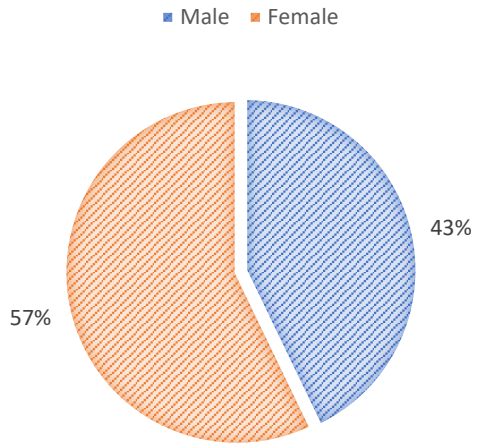


Figure 3.11 Respondent Gender

3.4.3 Education

All respondents who participated in the survey were literate. While majority of respondents (52 percent) could only read and write, 13 percent had attended primary schooling. 22 percent had completed their school-leaving certificate and 13 percent pursued higher education.

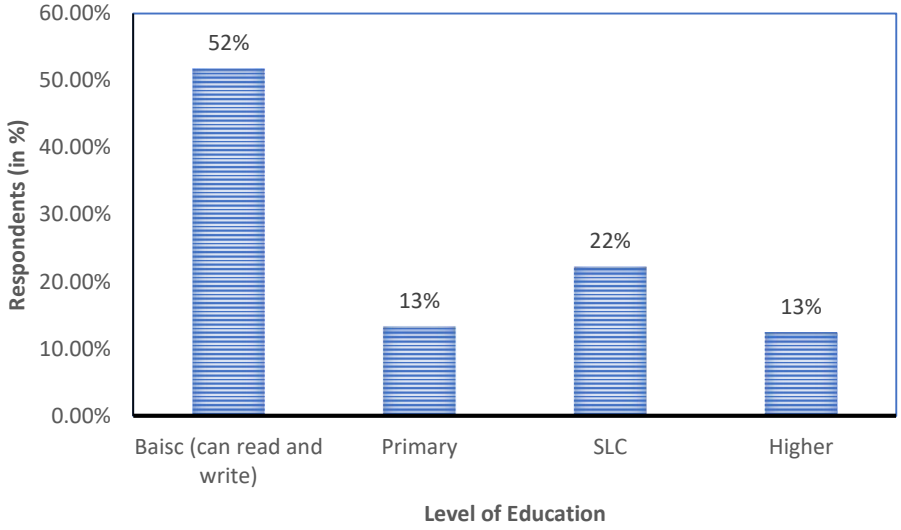


Figure 3.12 Respondent Education

3.4.4 Living Arrangement

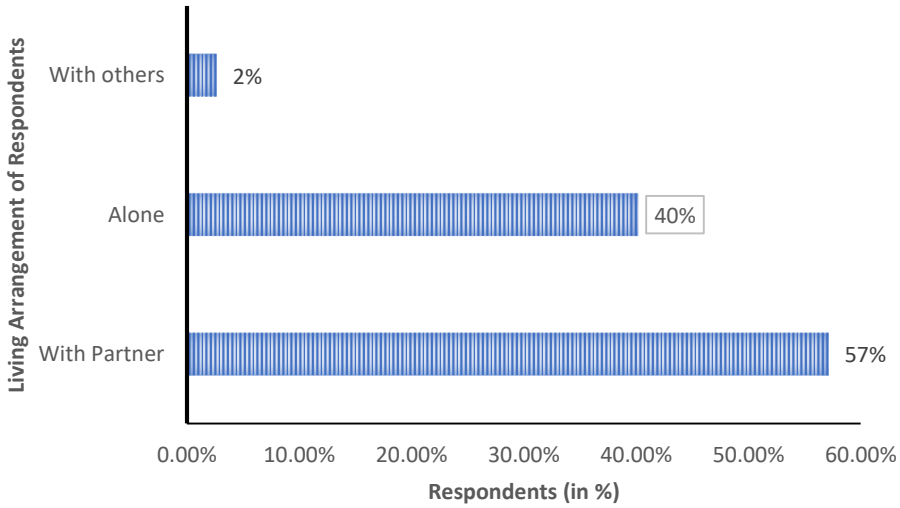


Figure 3.13 Respondent Living arrangement

Amongst the total respondents, 57 percent of respondents lived with their partner. A significant number of respondents (40 percent) lived alone and mere 2 percent lived with others.

3.4.5 House Ownership

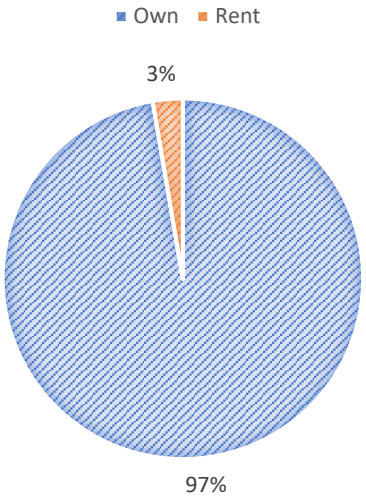


Figure 3.14 House Ownership

97 percent respondents owned the house that they were living in and only 3 percent were living in a rented place.

3.4.6 Monthly Income

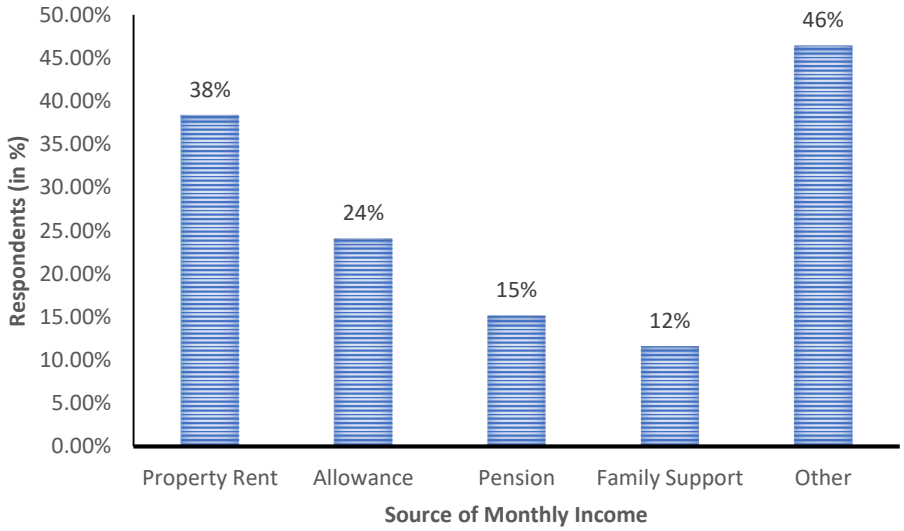


Figure 3.15 Monthly Income

38 percent respondents met their daily expenses through income from house rent, followed by allowance (24 percent), pension (24 percent), and family support (11 percent). 23 respondent (38 percent) between 60-65yrs daily expenses through rent and private businesses, like shops, wood carving, making incense, agriculture, selling vegetables, among others.

3.4.7 Chronic Illness

Amongst the total respondents, 46 percent suffered from heart related disease, and 21 percent were diabetic. 20 percent individuals had arthritis and thus had frequent pain in their joints. While only a negligible number of individuals reported mental illness, 29 percent reported other illness like asthma and liver diseases. Amongst the 29 percent, 22 percent did not suffer from any disease.

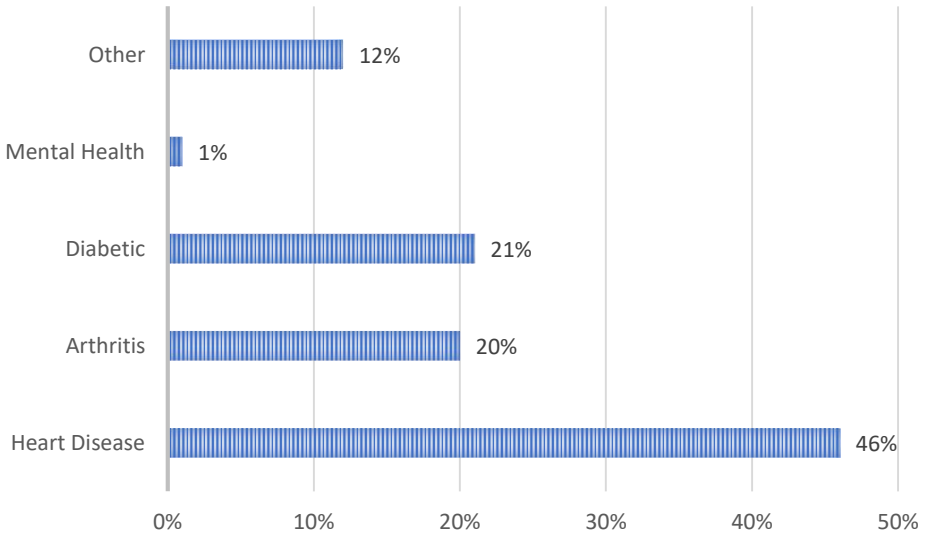


Figure 3.16 Chronic illness

CHAPTER 4. ANALYSIS

The major objective of this study is to access the notion of ageing in place, identify current condition of different imperative domains of age-friendly cities – housing, building, outdoor and neighborhood spaces, transportation, public spaces in core urban area of Lalitpur and analyze whether the current core urban city can promote independent and active ageing amongst the older population. This following section consists of the findings generated by the study through survey questionnaire, KIIs, and other secondary study.

4.1 The notion of Ageing in Place

Based on the literature review, it has been identified that the notion of ageing in place is a broad concept that encompasses the personal attachment of an individual towards a place that allows people belonging to old age groups attain a sense of identity and independence. Under this notion, older individuals desire to continue living in their homes and neighborhood despite their deteriorating physical health, mental health, mobility, and access to services.

The following section validates the notion of ageing in place among older individuals in core urban area of Lalitpur.

4.1.1 Length of residency

Figure 4.1 depicts that majority respondents, that represented 51 percent of total respondents, have been living in the locality for more than 10 years. Likewise, a significant number of respondents (38 percent) have been living in the locality since their birth. Only 2 percent of respondents had been living there for less than 5 years.

A general overview of the figure suggests that majority individuals have spent a significant number of years in the locality, such that, formation of profound attachment towards the place is natural. This is depicted by Figure 4.2, and 4.3.

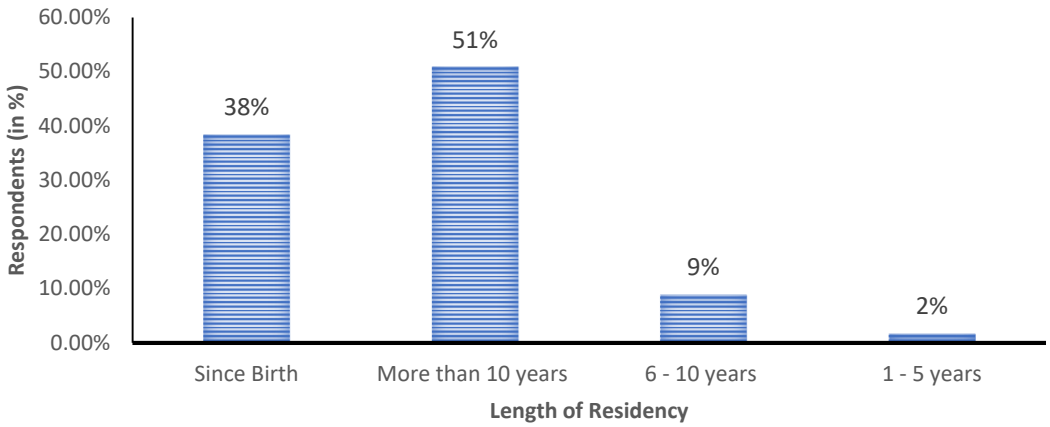


Figure 4.1 How long have you been living in this locality?

4.1.2 Satisfaction towards building and neighborhood

Figure 4.2 shows that 98 percent of respondents agree that they are satisfied with the current location of their building, and 98 percent of respondents agree that they are satisfied with their neighborhood. This justifies the desire of old age groups in core urban area of Lalitpur to continue living in the locality due to personal belongingness to the place.

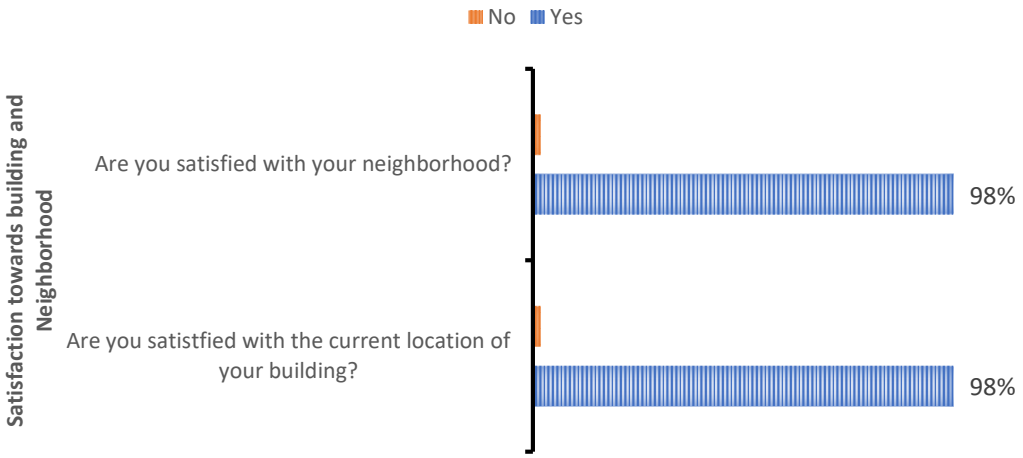


Figure 4.2 Are you satisfied with the current location of your building and neighborhood?

4.1.3 Attachment to the locality

Figure 4.3 further shows that majority of respondents (65 percent) feel very attached to the neighborhood. 33 percent respondents responded that their attachment is little. The study did not identify any respondent who did not feel attached to the locality that they were living in.

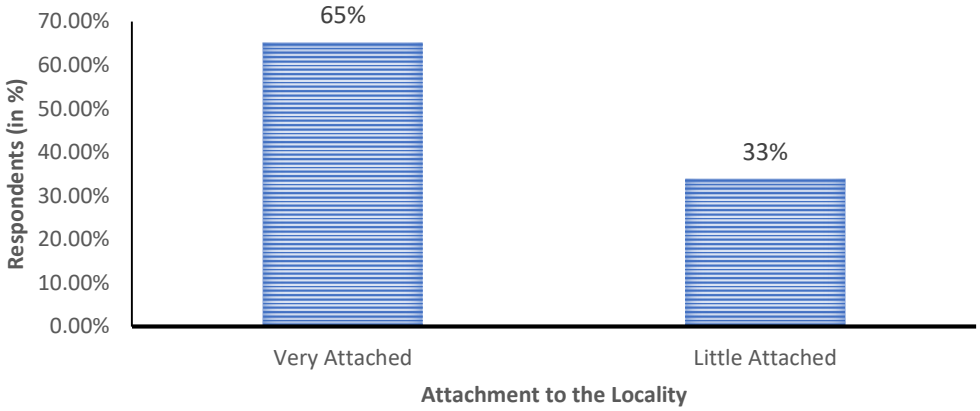


Figure 4.3 How attached do you feel towards your neighborhood?

4.1.4 Plans of migrating

Figure 4.4 shows that majority (82) percent of respondents did not plan to move from the location or migrate elsewhere in areas that are old-age friendly. Figure 4.5 further

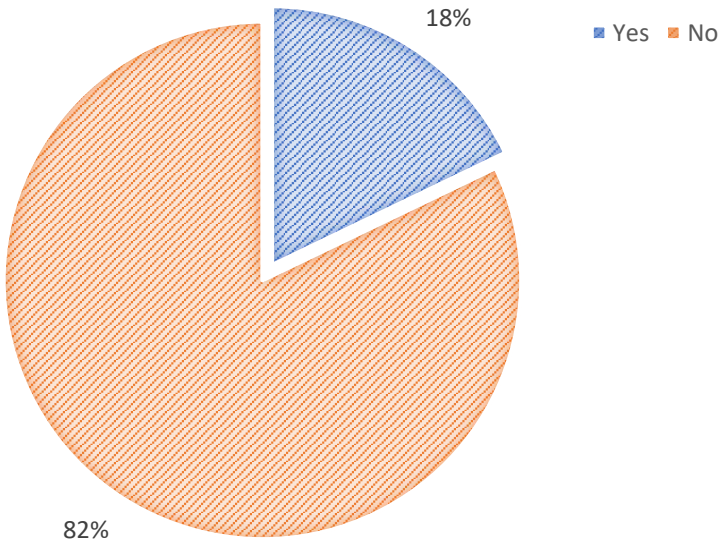


Figure 4.4 Are you planning to move from this location (migration)?

revealed that friendly neighborhood (54 percent) and having spent their lifetime (34 percent) in the locality were the major factor behind the denial to migrate. Only 2 percent of respondents and 8 percent respondents agreed that the design and layout of their house and the location of their building were major factor behind their decision to live in the place.

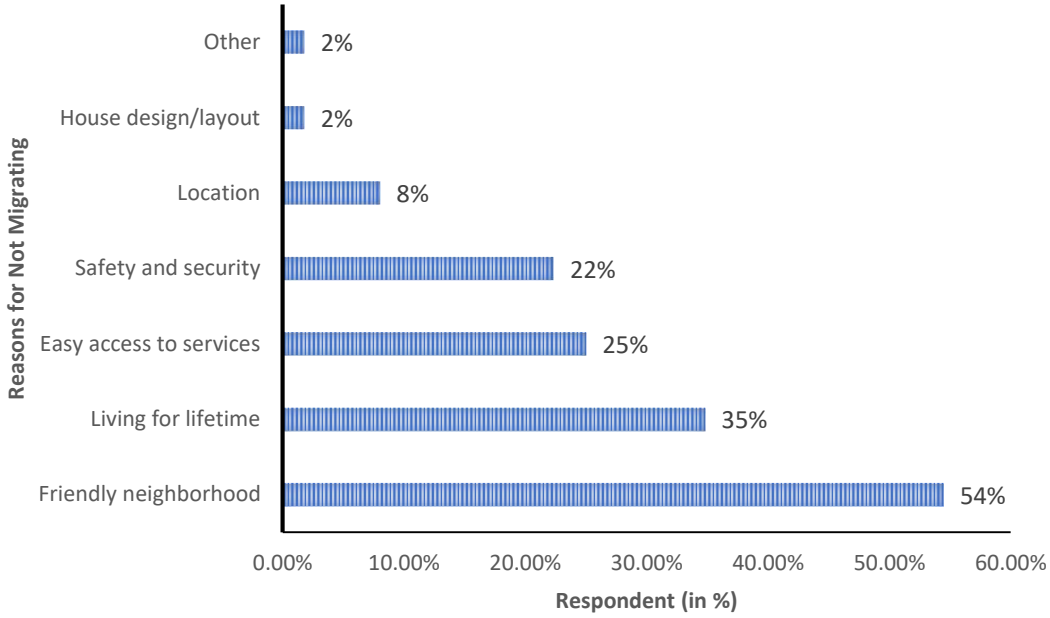


Figure 4.5 What are your reasons for not moving?

The findings establishes that the population that belong to 60 years or higher in core urban area of Lalitpur have a notion of ageing in place. The old-aged individuals not only prefer to live in the locality that they currently reside in, but also have a deep attachment and sense of belongingness towards the place.

As suggested by different studies ((Chau & Jamei, 2021); WHO, 2006; and OECD, 2015), the older population with a notion of ageing in place do not prefer to migrate from their current locality, house, and neighborhood and thus in such cities, old-age friendly built-in environment should be built.

With regards to the same, the following sections aims to identify the current built-in environment of core urban area of Lalitpur and ascertain if it corresponds to old age friendly built-in environment as suggested by WHO.

4.2 Age-Friendly Housing

Age-friendly housing are houses designed with much caution towards the changing need of people as they enter the older years of their lives. The fundamental reason behind such caution is to ensure safety, and comfort of older individuals.

The current condition of housing in core urban area of Lalitpur is briefly explained in the following section.

4.2.1 Dwelling Zones

Figure 4.6 illustrates that 78 percent respondents currently reside in residential zones. The remaining 21 percent individuals either live in commercial or both commercial and residential zones.

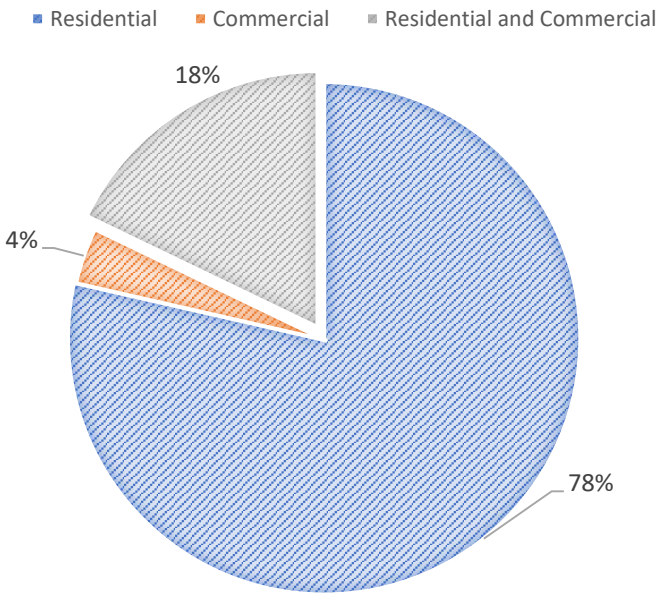


Figure 4.6 Dwelling Zone

4.2.2 Dwelling Form

Amongst the total respondents, 56 percent have row form of dwelling. In such type of houses, it is often difficult to manage spaces for private parking which further leads to difficulties in accessing the entrance to their dwelling. Additionally, the haphazard building of houses and other commercial buildings as led to row form of houses being

deficient of the required amount of sunlight and ventilation recommended for older individuals are often deficient. Likewise, it is often difficult to manage space within the dwelling that would allow older individuals to easily access rooms and services within their house.

Figure 4.7 depicts that 31 percent individuals have houses in courtyard and merely 12 respondents have individual homes.

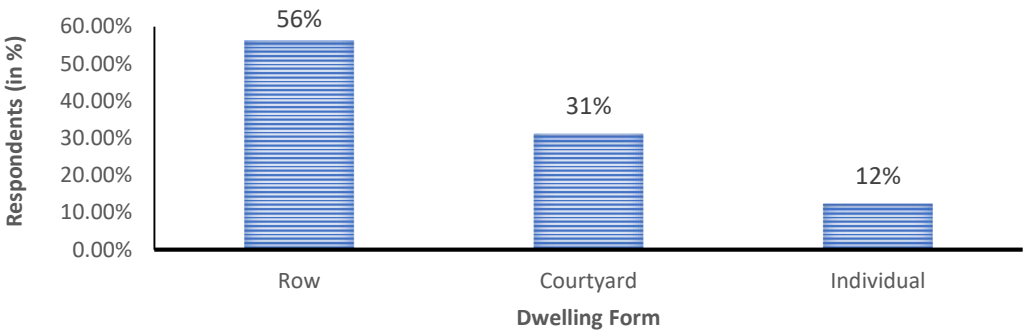


Figure 4.7 Dwelling Form

The pictures depicted in figure 4.8 and 4.9 shows row and courtyard form of dwelling respectively. The proximity of houses in row form of dwelling bars access to sunlight and ventilation for its residents. Likewise, narrow alleys in such form of dwelling also makes it difficult to access the entrance of the dwelling. Moreover, the frequency of vehicular movement affects walkability in the neighborhood and increases noise pollution.

Figure 4.8 Row dwelling form

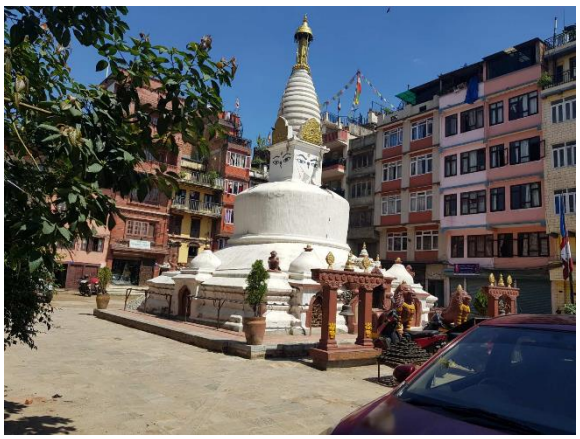


Figure 4.9 Courtyard dwelling form

The houses built in courtyard form address many problems associated to row form of dwelling. However, only the front faces of the house have access to sunlight, likewise, problem of ventilation might still persist. In recent times, given the use of open spaces in courtyard as private parking, ease of walkability and open space for social activities have been limited. Moreover, the ease of access to dwelling in its entirety depends on the ease of access to the courtyard itself, which in most areas need to accessed through narrow roads as in the case of row form of dwelling.

KII with Krishna Maya Maharjan, Women Member, Mikhabaha Jestha Nagarik Sewa Sadan, Patan Dhoka

Many houses that inhabit older citizens in the core urban area of Lalitpur are inside courtyards. While the courtyards have been an asset in fulfilling the social and security needs of the citizens in the past, today it poses two significant challenges for older adults. Firstly, the courtyards do not have access to sunlight as they are surrounded by tall buildings. Given the same, the houses situated inside the courtyard and its rooms also do not have adequate access to sunlight. Additionally, majority houses do not have balconies or other forms of accessing the sunlight. This can have an adverse impact on the health of older citizens. Another challenge is the growing number of vehicular congestions in the area and the use of courtyards as parking spaces. This has not only limited the open spaces in the core area of Lalitpur but also has made it difficult for older citizens to walk around in the courtyard or access the entrance to their buildings. Thus, Lalitpur should have a housing guideline that incorporates balconies, and it should not allow vehicle parking at courtyards in the daytime.

4.2.3 Type of Dwelling

Figure 4.10 depicts that majority respondents (79 percent) have houses based on RCC structure and 21 percent respondents have houses based on load bearing structure. It is recommended that tall buildings should be based on RCC structure as load bearing structure is only suitable for houses with less than two stories.

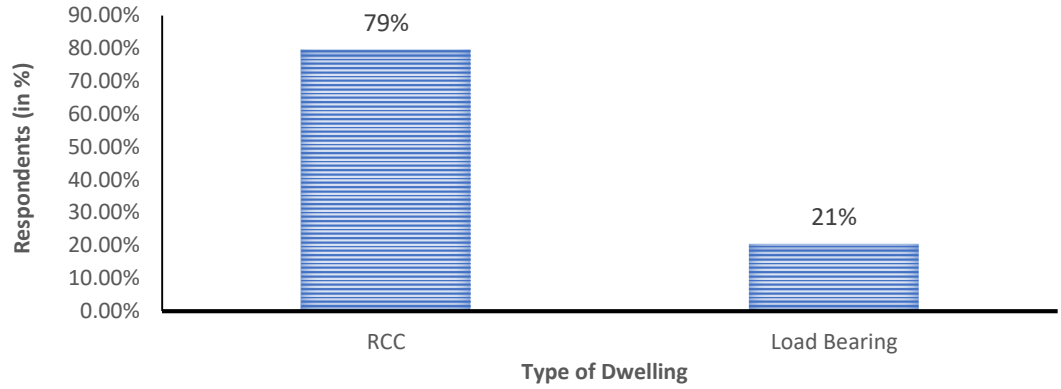


Figure 4.10 Type of Dwelling

4.2.4 Access to Dwelling

Amongst the total respondents, 37 percent access their dwelling from courtyard, 34 percent from residential street, 17 percent from non-vehicle alley, and 13 percent from main road. Except in the case of residential street, it is often difficult to access dwelling from other type of surrounding.

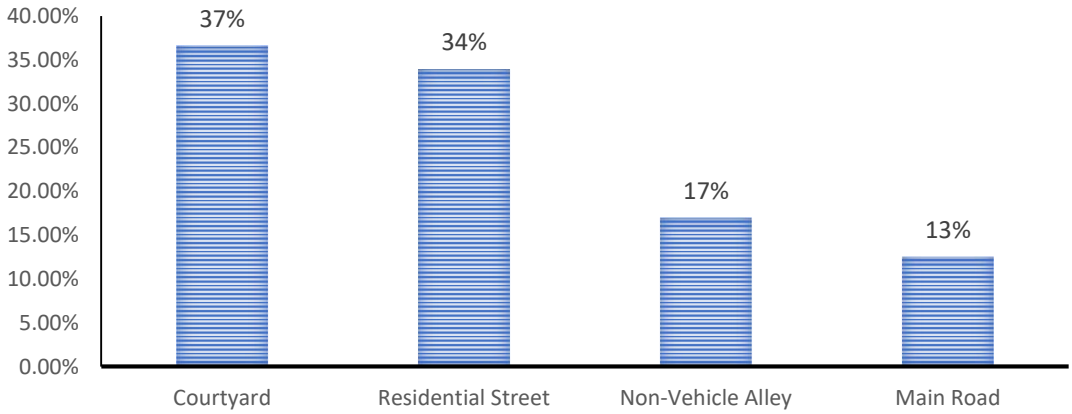


Figure 4.11 Access to Dwelling

Especially in Nepal, courtyards are often filled with parked vehicles which limits the mobility of individuals. Additionally, all form of vehicles do not enter all the courtyards, which requires older individuals to walk up to their houses, which is not usually the case in residential street. It is more difficult to access dwelling from non-vehicle alley as older individuals have limited mobility options. Likewise, main roads are often chaotic which might hinder an easy access to the dwelling.

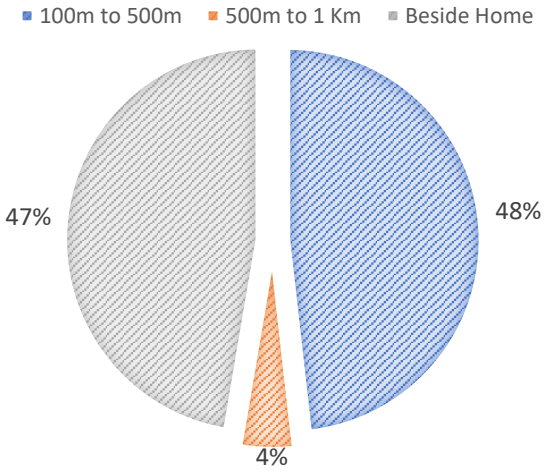


Figure 4.12 Access to Daily Activities

Figure 4.13 Access to daily Activities -1Km Diameter

Figure 4.12 depicts that 47 percent older individual in core urban area of Lalitpur can access daily activities related services right beside their home. However, 47 percent reported that such services are situated 100 to 500 meters away from their home. This implies that they have to walk for about 5 minutes to 15 minutes to access the services. Likewise, 4 percent respondents revealed that such services are situated at 500 meters to 1 kilometers away from their home. The longer distance in acquiring basic services limits the independence of older individuals.

4.2.5 Safety regarding Building Material

Figure 4.14 illustrates that 75 percent of respondents feel safe regarding the building material used in their houses. However, safety regarding building material is a major concern for the remaining 25 percent, as they do not feel safe in the building.

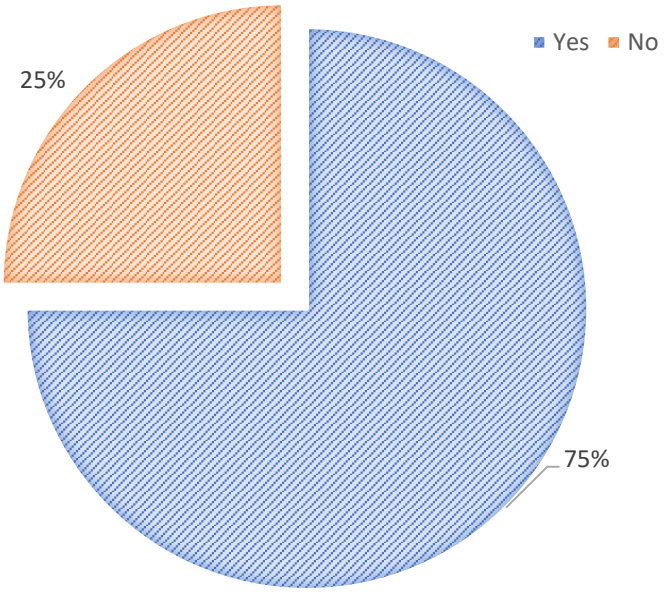


Figure 4.14 Do you feel safe in your building regarding building material used?

4.3 Age-Friendly Building

Age-friendly building are houses designed to enable older aged people to live independently despite compromised physical and mental health. Much caution should be paid towards the interiors of the houses to ensure that old age people have easy

access within the house, which do not further aggravate the problems faced during later stages of life.

The current condition of building inhabiting older population in core urban area of Lalitpur is briefly explained in the following section.

4.3.1 Number Stories in the Building

Figure 4.15 suggest that majority respondents live in buildings with more than 3 stories. 63 percent respondents have three to four stories in their house and 32 respondents have more than 5 stories. Older aged individuals often face difficulty in conducting their daily activities if the number of stories in the building is high. It implies that individuals need to frequently climb up or down the staircase to conduct different activities. This makes them dependent on others as older individuals have limited physical capabilities.

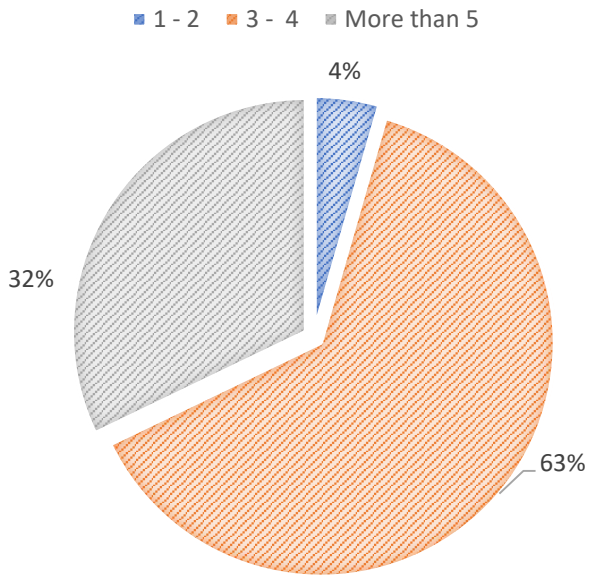


Figure 4.15 Total stories in the building

Figure 4.16 shows the most common type of building section structure in core urban area of Lalitpur. It shows that majority houses have only one room per story and thus, elderly citizens need to frequently use staircase to access different rooms in the house. Due to weak physical abilities, many elderly citizens are forced to spend majority time in their bedroom and have limited social interaction.

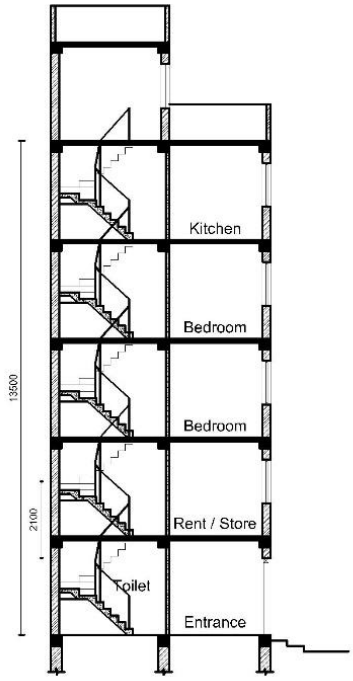


Figure 4.16 Section of more than 5 stories building in core urban are of Lalitpur

4.3.2 Number of Rooms Used

As depicted by Figure 4.17, 58 percent of respondents use three to four rooms and 28 percent respondents use more than four rooms in their building. However, given the nature of buildings in higher storied houses, accessing the different rooms are difficult for older adults.

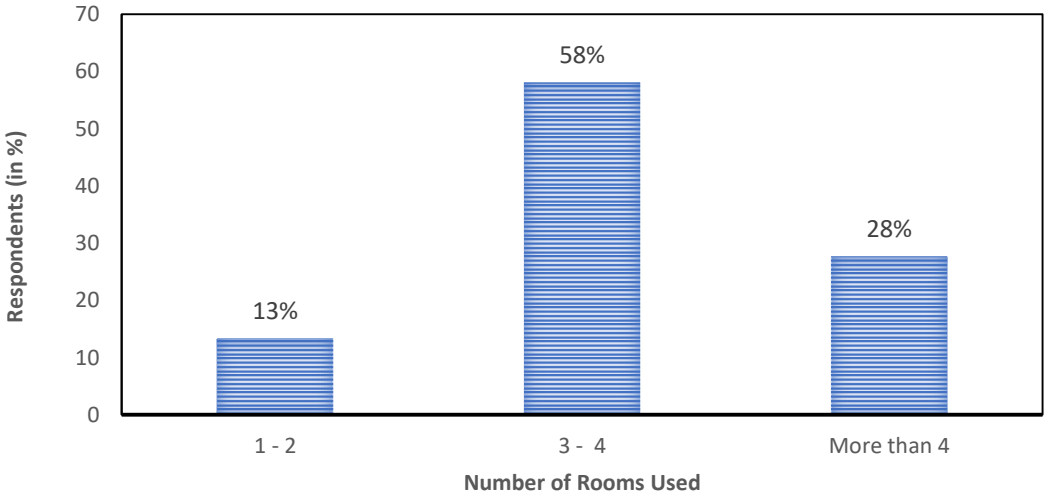


Figure 4.17 Rooms used

4.3.3 Access to Bedroom

Majority of respondents (53 percent) have bedroom on the third floor of their building as shown in figure 4.18. Likewise, 30 percent responded that their bedroom is situated on the second floor. 6 percent of respondents said that their bedroom is situated higher than third floor. Bedrooms at higher levels are not suitable for older individuals as it requires them to use staircase frequently.

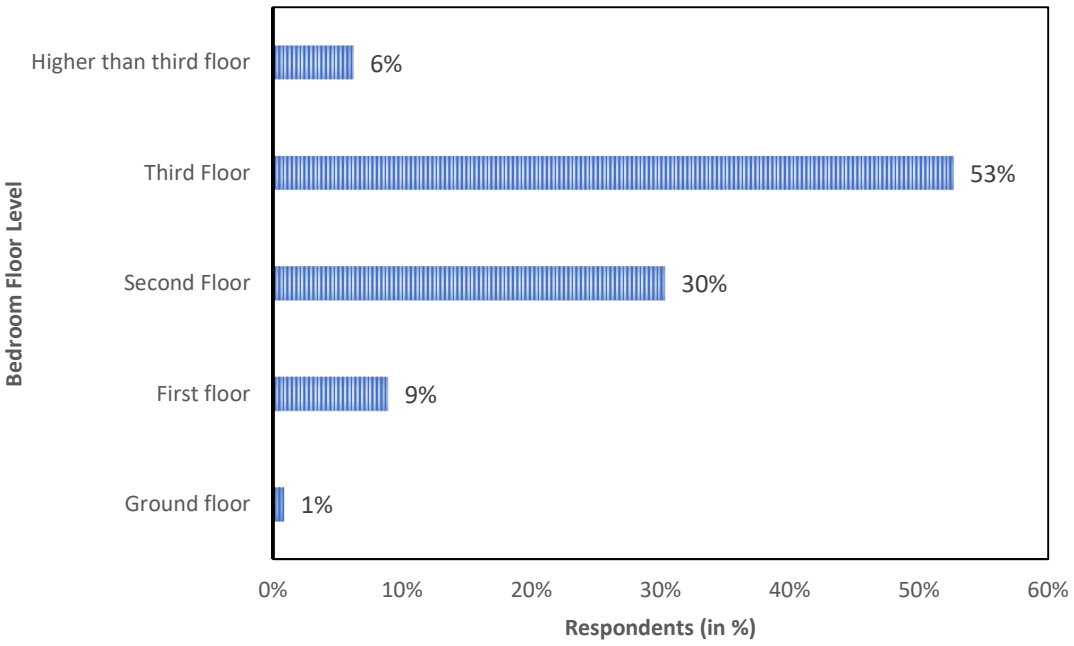


Figure 4.18 Bedroom Floor Level

Excessive physical strain in using staircase can limit their mobility within the house and thus make them more dependent. Moreover, it also bars them from easy access within their houses. The survey further depicted that 15 percent of the individuals prefer all rooms on the same floor as it enhances both their mobility and access to utilities within the house.

4.3.4 Access to Kitchen

The study identified that 16 percent of respondents are not satisfied about the location of their kitchen. Amongst the respondent, it was reported that the major problem behind their dissatisfaction was that the kitchen were not on the same floor.

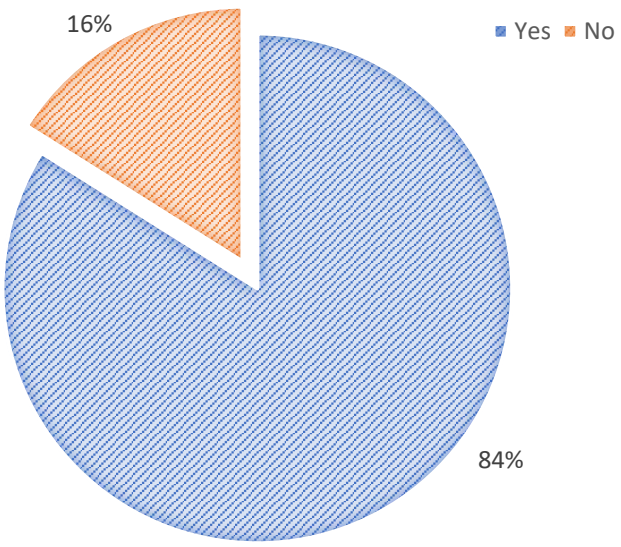


Figure 4.19 Are you satisfied with the kitchen location in your building?

4.3.5 Access to Toilet

While majority respondents said that they are satisfied with the location of toilet in the building, 23 percent responded differed in the opinion. The survey further revealed that individuals who are not satisfied with the location of toilet prefer toilet on the same floor or attached to their bedroom. Having toilet on a different floor was the main concern behind their dissatisfaction.

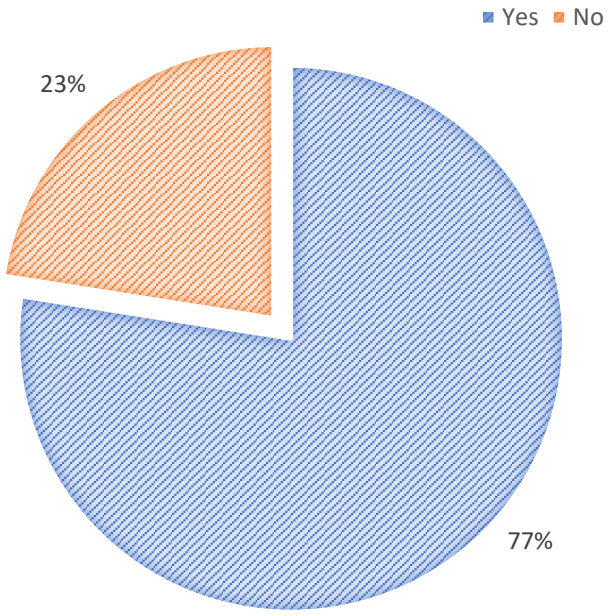


Figure 4.20 Are you satisfied with the toilet location in your building?

4.3.6 Staircase Mobility

Figure 4.21 illustrates that 44 percent of the respondents are not satisfied with the staircase in the building. A general notion behind the dissatisfaction is attributed to diminishing physical capability to easily climb up and down the staircase. The survey revealed that higher number of stories and having to climb the staircase made them tired. They also responded that they did not have handrail in the traditional stairwell that made their mobility much difficult.

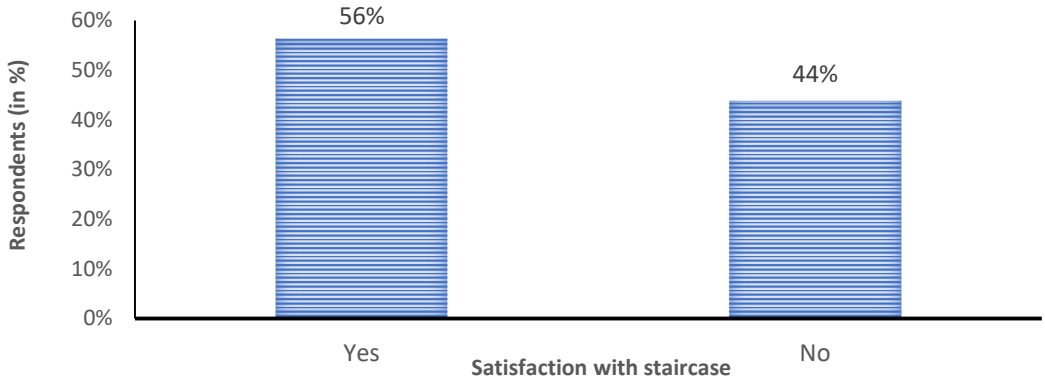


Figure 4.21 Are you satisfied with the staircase in your building?

4.3.7 Access to Light and Ventilation

Access to light and ventilation is regarded as important for the health of old aged individuals. While 74 percent of respondents were satisfied with the level of light and ventilation in their building, 26 percent were not satisfied.

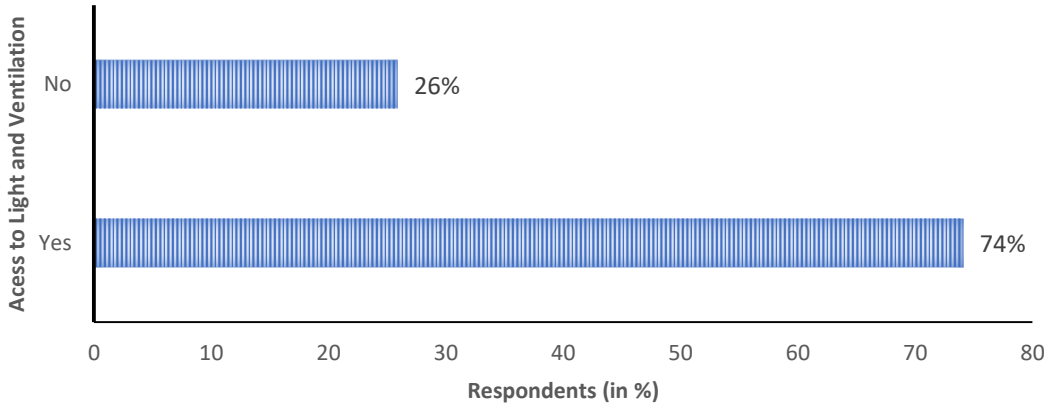


Figure 4.22 Are you Satisfied with the Natural Light & Ventilation in Your Building?

KII with Roshani Karmacharya, Jestha Nagarik Samaj- Nepal

In order to make the core urban area of Lalitpur age-friendly, the city definitely requires a lot of modifications. The buildings in the area are tall and thus a significant number of older residents find mobility inside the house difficult. Additionally, it is exceptionally difficult for older residents whose houses are situated beside the main road. Firstly, they are reluctant to keep the windows closed due to both air and noise pollution, which restricts them from access to sunlight as well as proper ventilation. Moreover, they do not have easy access to open spaces and often refrain from coming out of the house due to excessive road-traffic and vehicular movement. Many elderly citizens are scared to come out in the open and spend most of the times in their own room. This has taken a serious toll on their mental health and They are at a higher risk of being diagnosed with depression. Some citizens have in fact migrated to peripheral settlements due to such problems.

4.4 Age-Friendly Outdoor Spaces and Neighborhood

Age-friendly outdoor spaces and neighborhood facilitate older citizens to enhance their livelihood and wellbeing, by especially helping them tackle mental health challenges associated with depression or feeling lonely. Safe, comfortable and accessible outdoor spaces and neighborhood enhances the willingness of older citizens to come out of their house and spend time in the open, which is preferable for both physical and mental soundness.

Figure 4.23 Outdoor space – Nagbahal

Figure 4.24 Enclosed open space-Daubahal

4.4.1 Public Open Spaces

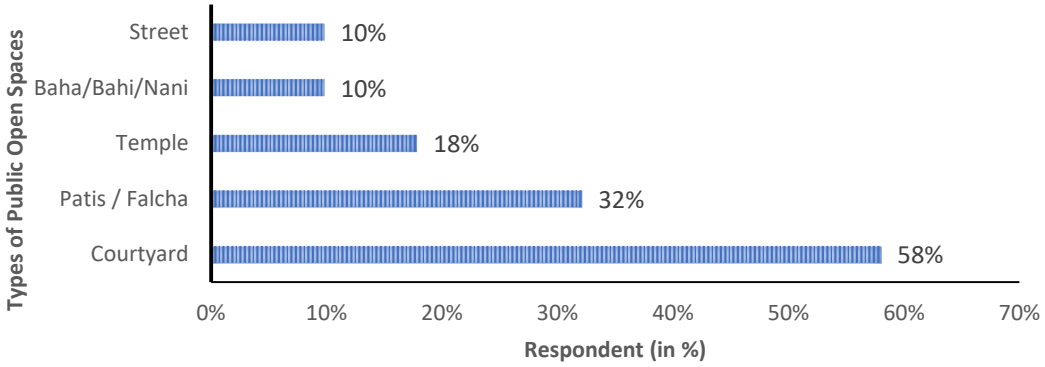


Figure 4.25 Types of Open Spaces

Figure 4.25 shows that courtyard, *patis and falcha*, *baha/bahi/nani*, temple, and street are the types of open spaces in the locality of the respondents. Majority (58 percent) respondents reported that their locality consist of courtyard. Likewise, 32 percent, 18 percent and 10 percent reported that they have access to *patis and falcha*, temple, and *baha/bahi/nani* as open spaces respectively. However, 10 percent respondents said that street were the only open spaces available in their locality.

However, in recent years the courtyards and other open spaces in the communities located in core urban area of Lalitpur has experienced encroachment in the form of private vehicle parking. These courtyards do not serve as open spaces as it is always occupied with motorbikes and cars, limiting the space available for open spaces.

Figure 4.26 Courtyards encroached with Vehicle Parking

Figure 4.27 Patis – Lukhusi

Figure 4.28 Temple – Hiranya Mahabihar

Figure 4.29 Bahal – Nagbahal

Figure 4.30 Street - Agnisar

4.4.2 Open Spaces for Daily exercise

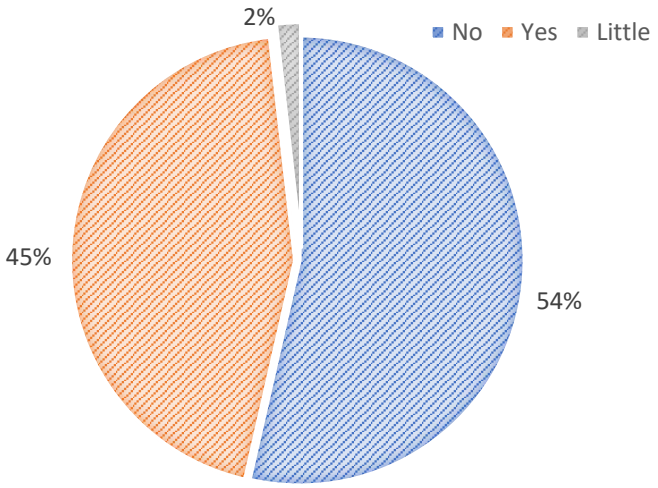


Figure 4.31 Daily Exercise spaces

54 percent of respondents reported that they did not have any type of open spaces available for exercise. Likewise, 2 percent said that the space available for daily exercise is minimal. This suggests the inadequacy of open spaces for old aged individuals to exercise, which is one of the imperative components of an age-friendly city.

4.4.3 Public Outdoor Seating Space

75 percent respondents reported that their outdoor space did not consist of any seating space. Likewise, 4 percent said that the available seating space is little as shown in figure 4.32. Outdoor seating space is one of the key features of age-friendly city as it ensures that the older citizens enjoy their outdoor space where they can not only rest but also can spend time with their friends, children, and neighbors. It is imperative for both physical and mental health of older citizens.

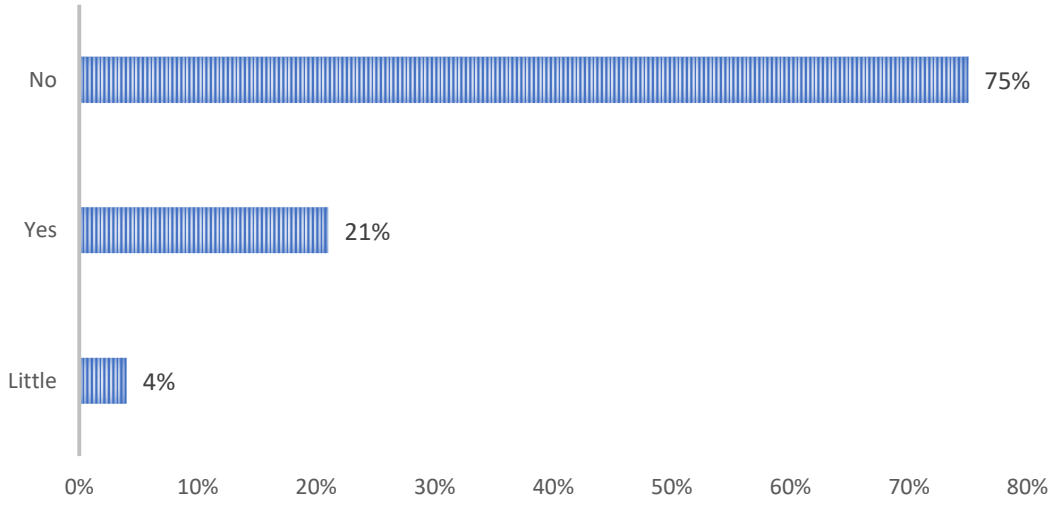


Figure 4.32 Public Outdoor Seating

Given the lack of outdoor seating space, older adults in core urban area of Lalitpur sit at Plinth/Falcha available outside the private houses of people. The problem with this is that only some individuals have access to such seating place, while majority adults do not have place to rest or sit while outside their houses. This can be a major reason behind unwillingness of elderly citizens to come out of their houses.

Figure 4.33 Sitting Space – Shop

Figure 4.34 Sitting Space – Plinth / Falcha

4.4.4 Public Toilet

Public toilet is also one of the essential component of age-friendly city. Moreover, it is recommended that age-friendly cities require public toilet that has special functions to facilitate people with disabilities. However, 94 percent respondents reported that they do not have any public toilet in their locality. This requires the old aged individuals to depend on their homes in order to use the toilets. Given the inability to frequently travel from outdoor to homes, the mere fact regarding unavailability of public toilets results in mobility restriction in outdoor space for older citizens.

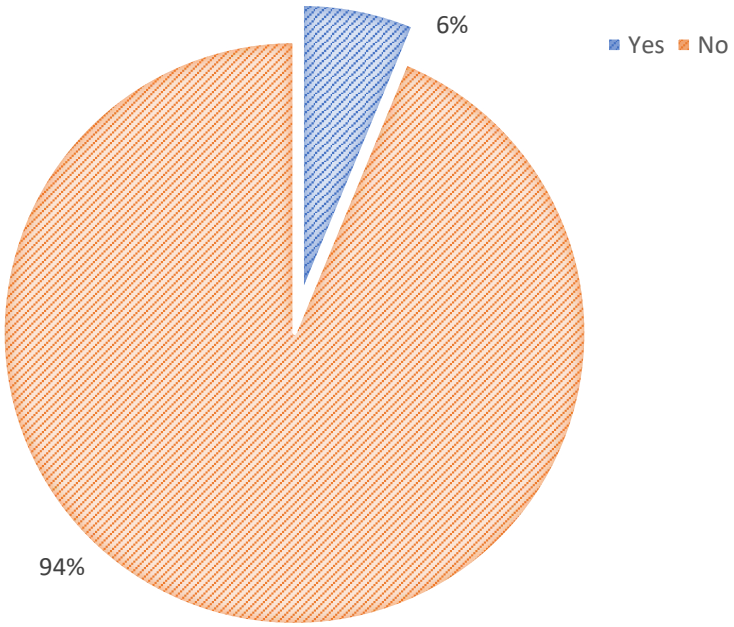


Figure 4.35 Public Toilet

4.4.5 Evacuation Spaces for Natural Calamities

Nepal is an earthquake prone country. The mega-earthquake of 2015 had a severe impact on majority cities in the country, including Lalitpur. Thus, evacuation space for natural calamities is of utmost importance. However, 63 percent respondents reported an absence of such spaces in their locality. Given the inability of older citizens to swiftly evacuate to distant places, evacuation areas within short distance of housing is widely recommended. However, the core urban area of Lalitpur lacks this aspect of age-friendly city.

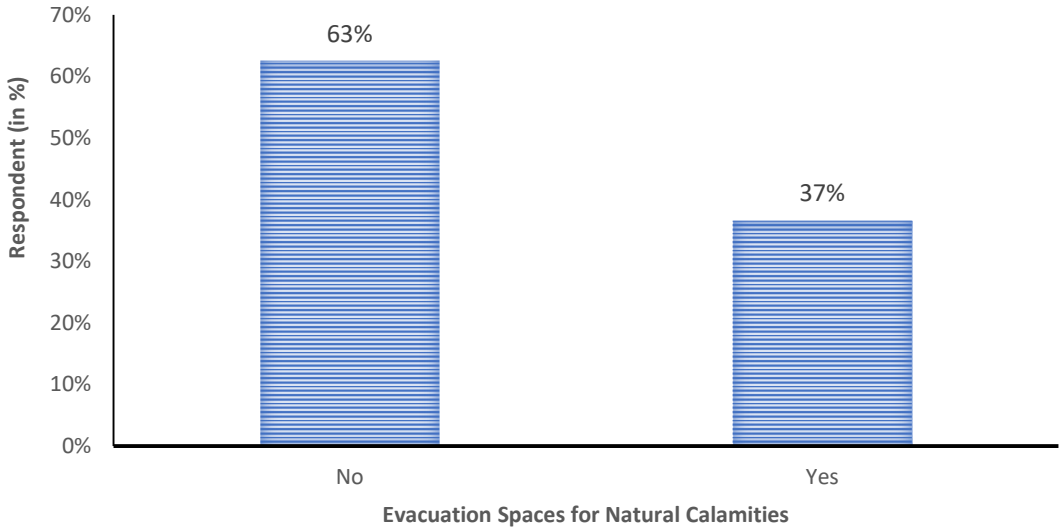


Figure 4.36 Natural Calamities Evacuation Spaces

4.4.6 Ease of Walkability

44 percent respondents reported that they feel safe and comfort while walking around their neighborhood. While 36 percent respondents reported that they feel only a little comfort or safety while walking in their neighborhood. 3 percent reported that they do not feel safe at all. The number of respondents who face difficulty in walking in the neighborhood reported vehicle movement and congestion to be the major hindrance.

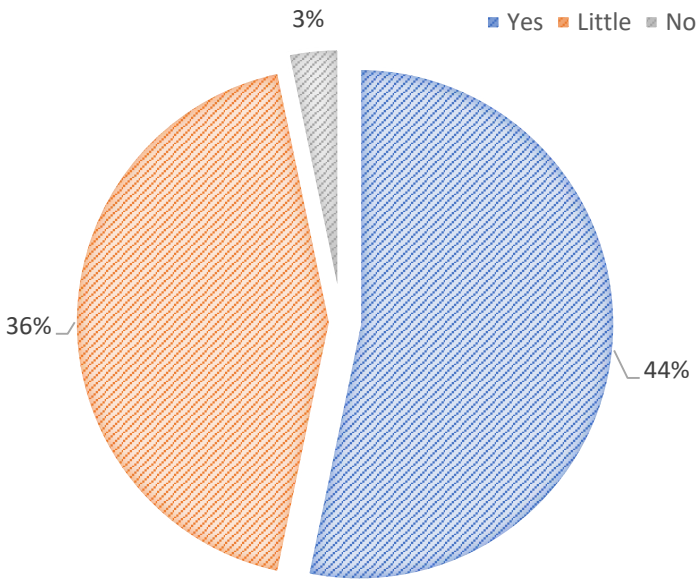


Figure 4.37 Do you feel safe/comfort while walking in street, road, and alley of neighborhood?

Walkability can result in different health benefits for older citizens. Moreover, it is an important aspect for older citizens who cannot drive private vehicle or need to frequently access goods and services at short distance. If difficulty in walking persists due to problems in the surrounding, older citizens often find themselves dependent or in isolation at home which affects both their physical and mental health.

KII with Pabitra Adhikari, Program Coordinator, Ageing Nepal

The building and housing structure in Lalitpur is not age-friendly, but, the neighborhood and community are supportive of older adults. However, the public infrastructures and services for sound physical and mental health of elderly citizens are either not easy accessible or unavailable in the city. The major spaces that Lalitpur lacks are age friendly parks and other public places for entertainment and community participation. The city also needs to consider affordable transportation and health services while planning.

4.5 Age-Friendly Social Participation, Community Support and Health Services

The built-in environment and health of older citizens are closely related. Social infrastructure that enables the citizens to participate socially as well as that provides health as well as other forms of care is desirable for age-friendly cities.

4.5.1 Care and Ageing Well Services

Care and ageing well services include support and health services for older citizens. It includes a range of services from facilitating healthy ageing through diet and exercise, to clinics and hospitals, to counselling services, to specialized care. Among the total respondents, 85 percent reported that care and ageing well services were not available in their neighborhood. Access to such services would enhance the wellbeing and quality of life of older citizens.

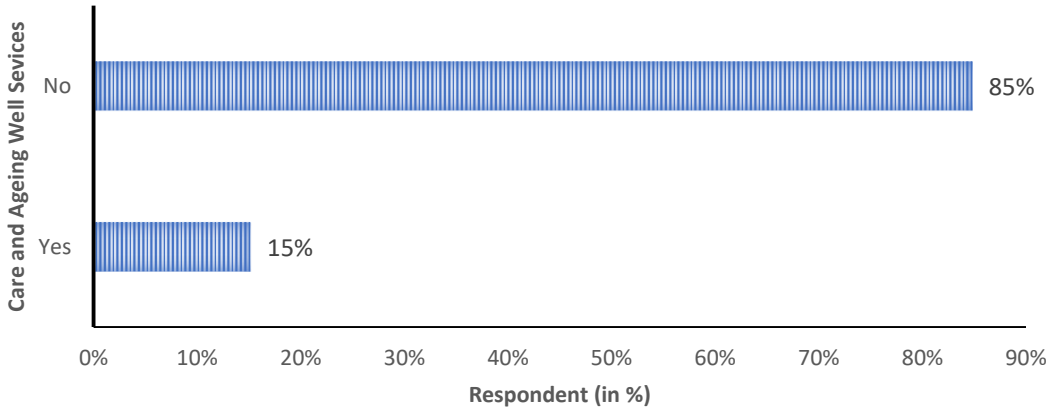


Figure 4.38 Are there any care and ageing well services in your neighborhood?

4.5.2 Day Club Spaces

Day club spaces for older adults refers to centers who take special care of older citizens. The centers not only provide care to older citizens with diseases like dementia and Alzheimer's, but also provide a sound environment for older citizens to socialize and overcome loneliness. In the core urban area of Lalitpur, 85 percent respondents reported that such services were non-existent in their neighborhood.

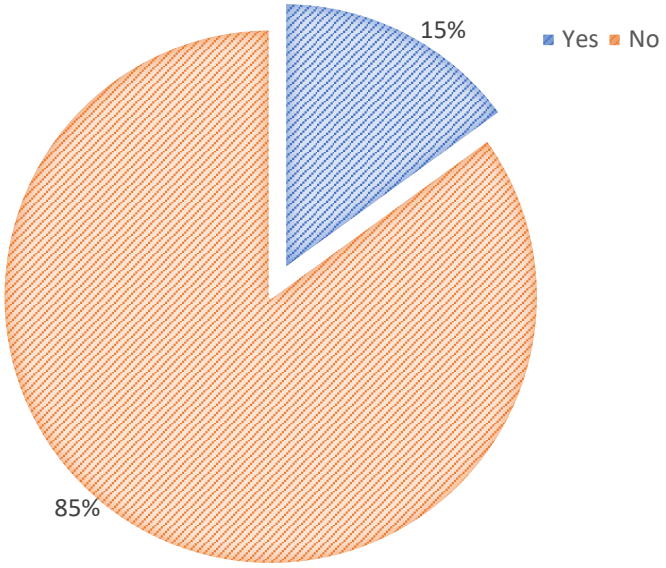


Figure 4.39 Do you have day club spaces in your neighborhood?

4.5.3 Community Building (Library, Entertainment Venues, and Social Club Spaces)

Other types of spaces that are desirable in age-friendly cities are spaces that augments social participation of older citizens. Such places include library, entertainment venue, club spaces, where the older citizens can socialize with one another which helps keep their mental health sound. However, 88 percent respondents reported that their neighborhood did not have such places.

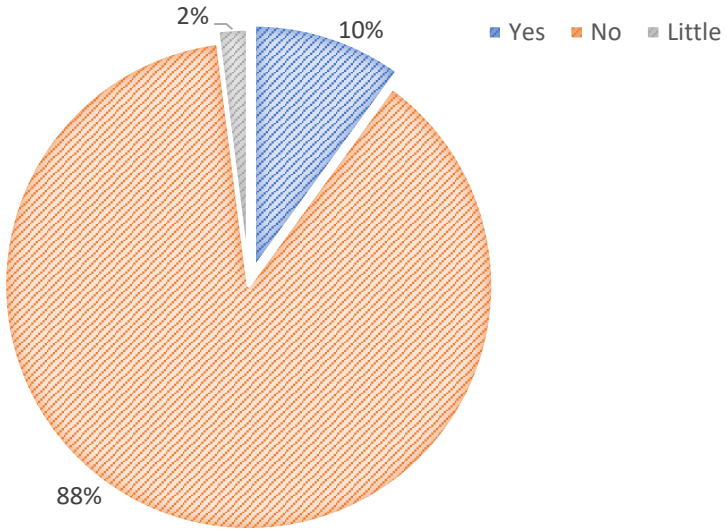


Figure 4.40 Do you have library, entertainment venues, and social club (new hobbies, passions) spaces in your neighborhood?

4.5.4 Desired Modifications

The respondents in core urban area of Lalitpur suggested that modifications that incorporated clinic, old-age day care, parks, library, community hall, and sitting spaces in their locality is desirable. Majority respondents reported that they would prefer to add clinics in the locality. Likewise, 49 percent also reported the need for old-age day care center.

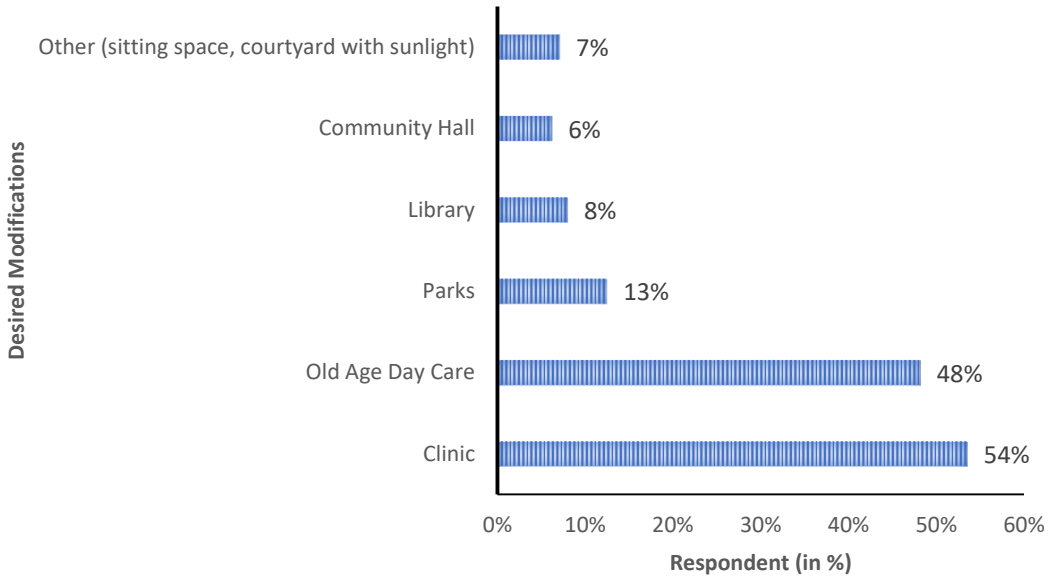


Figure 4.41 Is there any modifications that you would need in your neighborhood?

4.6 Age-Friendly Transportation

To increase the quality of life of older citizens and to prevent social exclusion cities are required to have safe and connected walkability, as well as public transport system that is easily accessible. This not only allows them to access services available in their community but also enhances their access to health services.

4.6.1 Mode of Transportation

The survey depicted that the older individuals in core urban area of Lalitpur used mediums like bike/scooter, walking, and public transport for transportation. While majority respondents (98 percent) walk, 24 percent and 23 percent respondents also used bike/scooter and public transport as shown in figure 4.42.

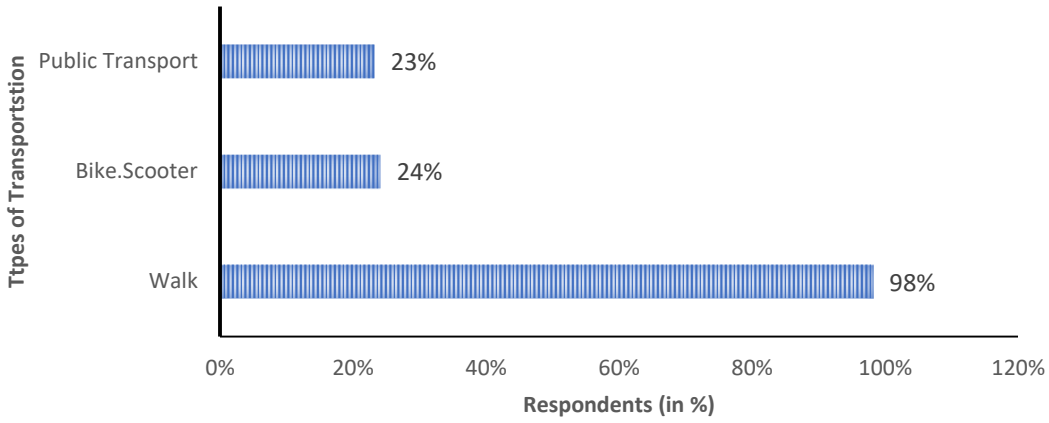


Figure 4.42 Type of transport medium used

It can thus be interpreted that walkability in the neighborhood is an important aspect for the city to be age friendly. However, the survey identified that congestion and vehicle movement in the area had adverse effect in comfortable walkability for these adults.

4.6.2 Vehicle Movement in the neighborhood

59 percent respondents reported that vehicle movement in the locality was high and 22 percent said that the movement was heavy. Given higher vehicle movement in the locality, older citizens often find walking difficult and uncomfortable. This can have adverse effect on their willingness to walk in the neighborhood.

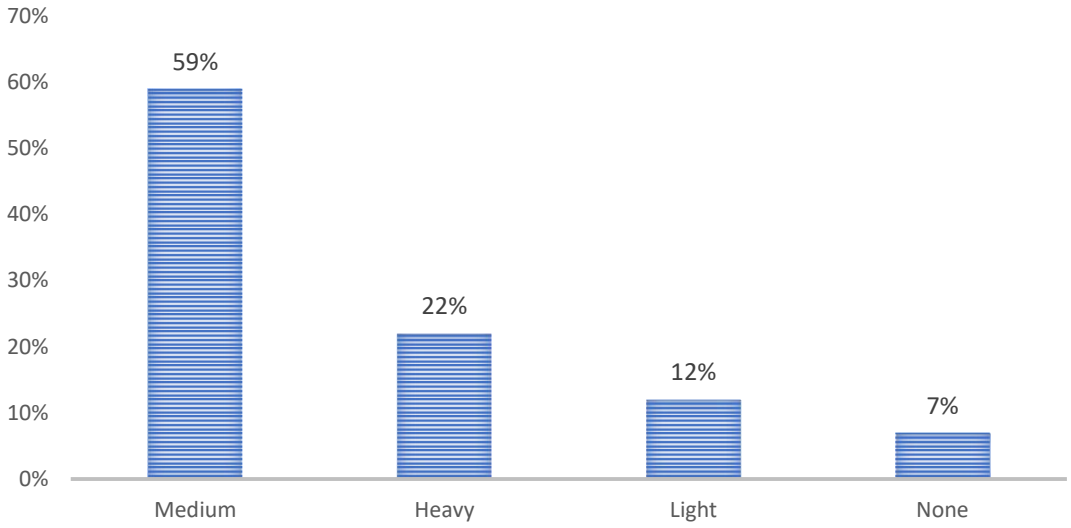


Figure 4.43 Amount of vehicle movement in neighborhood

4.6.3 Easy Access to Public Transport

74 percent respondents responded that access to public transport was difficult as the public transit stations were at greater distance from their houses. As depicted in previous section, majority of respondents live in row or courtyard form of dwelling where access to public vehicle is not possible and walking is the only option available. This constraint hinders the ability of individuals to visit places, thus limiting their social participation as well as ability to work.

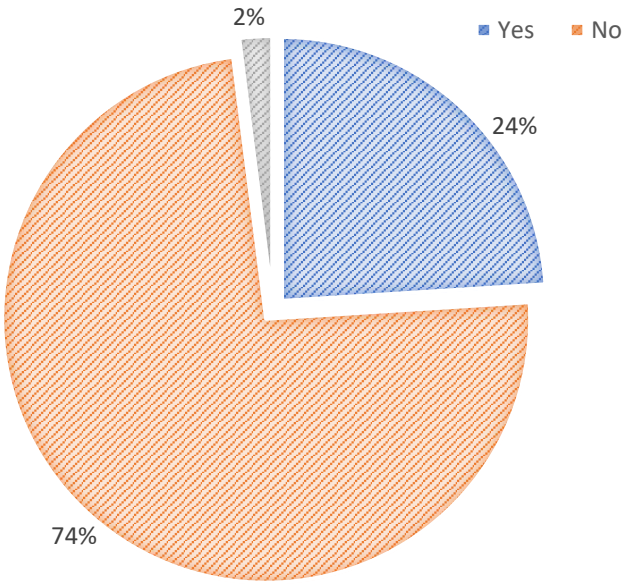


Figure 4.44 Are public transportation easily accessible in your neighborhood?

4.6.4 Parking

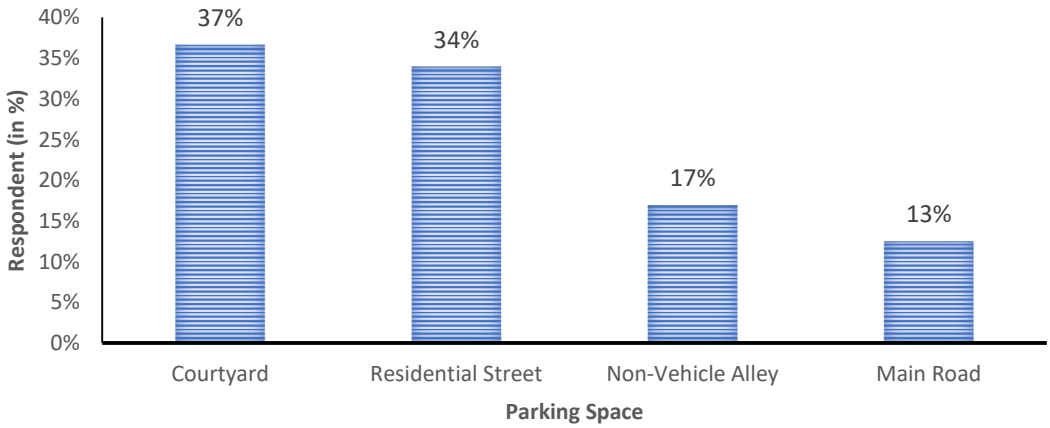


Figure 4.45 Parking Spaces

37 percent individuals live in courtyards, 17 percent in non-vehicle alley and 13 percent in main road. This implies that access to parking spaces for such individuals is difficult. Majority courtyards, build for the purpose of free mobility and open outdoor spaces for social activities are now used for parking. Older individuals living in courtyard and non-vehicle alley have limited option but to walk to their desired destination which can make them more dependent and isolated as their physical ability declines.

Figure 4.46 Courtyard with Bike Parking

KII with Prakash Gautam, Director, Ageing Nepal

Day care centers and old age homes are on the rise in Lalitpur city. About a decade ago, such spaces were very limited, but today both government and the private sector have been actively involved in providing such spaces. One priority infrastructure that is being built at ward level are meeting spaces for elderly people to socialize where they can not only participate socially but also can spend time with one another and build support system for themselves. However, one imperative aspect that Lalitpur misses out on is retirement homes. In today's world many of the older population are retired from different sectors and have different abilities, however, spaces where these individuals can exercise and utilize their experience, skill, and knowledge is not available in Lalitpur. It can be imperative for their sound mental health. Other aspects that Lalitpur misses out on are roads that are easily walkable, park, community activities, open spaces, and other infrastructures like public toilet, spaces for public seating and rest, community halls, among others to help elderly citizens conduct their day to day personal and social activities smoothly. All in all, the current built environment in Lalitpur is not age friendly and the government should consider aspects of active ageing in devising plans and programs for the city.

CHAPTER 5. DISCUSSION

World Health Organization (2002) introduced the concept of Active Ageing with the intention to facilitate active and independent ageing of individuals amidst a growing population of older aged adults. World Health Organization (2007) also introduced eight domains of an age-friendly city that would enhance both the physical and mental capabilities of older adults with the aim to enhance their quality of life and well-being. The framework is targeted at designing age-friendly housing, buildings, outdoor spaces, and infrastructure to better cater the needs of older individuals. One of the widely discussed phenomena that are imperative for designing age-friendly cities is the notion of ageing in place (WHO, 2007; Wiles, et al., 2012). It establishes the need to design age-friendly housing, building, and outdoor spaces and neighborhood in respective localities of older adults as such individuals refrain from migrating to other cities or old-age homes due to personal belongingness and attachment to the areas or localities that they have been residing in.

Based on the aforementioned phenomenon, this study attempted to establish the notion of ageing in place amongst the ageing population in core urban area of Lalitpur – individuals above 60 years of age. Furthermore, this study also aimed to identify the current condition of different domains imperative for an age-friendly city and analyze whether the current city can promote independent and active ageing amongst the older population.

A brief overview of the findings suggests that while the notion of ageing in place is prominent in the core urban area of Lalitpur. However, the current condition of housing, building, outdoor spaces and neighborhood, transportation, and infrastructures pertaining to social participation, and community and health support is inadequate to facilitate the independence of older population and to enhance both their wellbeing and quality of elder life.

5.1 The notion of Ageing in Place

The findings of this study revealed that more than 98 percent of respondents in core urban area of Lalitpur had been living there for more than 5 years. Moreover, 89 percent

of elders had been living there either since birth or for more than 10 years. While 65 percent of respondents felt highly attached to the locality, 82 percent respondents did not want to move from the locality despite significant compromises in their physical abilities to cope with the place. This sense of personal belongingness and attachment to the locality establishes a sense of the notion of ageing in place (Harreman, 2020). The findings confirm that of the Report (2016) which mentions that elderly citizen in Nepal choose to live in their original homes and hope to age in place. Additionally, ageing in place with no support system or children is becoming common in Nepal.

This explains the findings identified by Chitrakar (2001) whereby it was revealed that more than 50 percent of old-age homes and care centers for the elderly were not operating as the older age group in Nepal did not feel psychological, social, and physical needs to visit such places. This elucidates that the actively ageing population in Lalitpur prefers ageing at their respective locality rather than care centers or old-age centers despite the services at such places being more old-age-friendly. However, as pointed out by Lweis and Buffel (2020), the entrenched notion of ageing in place for the elderly population in Lalitpur can be a barrier to active ageing as the environment of a such rapidly urbanizing city can be hostile towards the population. Thus, there is a need to build or modify the core urban area of Lalitpur, such that, it would be more old-age-friendly to enable elderly citizens to not only live independently but also to maintain their mental and physical health imperative for quality of life and wellbeing.

5.2 Age-Friendly Housing and Building

Upon review of responses from individuals representing the age group of 60 and above, the core urban area of Lalitpur less responds to the majority of criteria imperative for an age-friendly city.

As recommended by World Health Organization (2007) and other age-friendly housing guidelines published by Livable Housing Australia (2017), RIBA (2019), among others, housing and buildings in age-friendly cities should be designed with much caution as it has a significant bearing on the quality of life of old-aged groups. Such designs should not just ensure safety and comfort but also should be able to provide

easy access to services both within and outside the house. It should be designed with utmost care regarding the deteriorating physical capacity of the individuals. Complex structures of housing including the locality of the house can result in social isolation of the individuals due to restrictions in their mobility and access which results in an increased feeling of loneliness and depression.

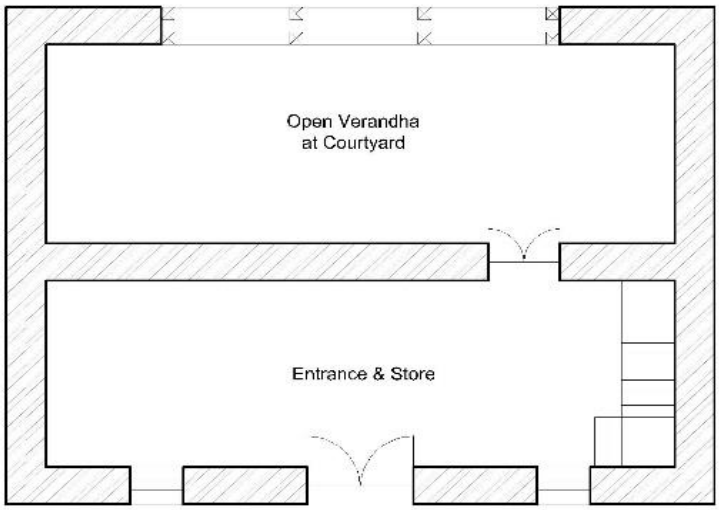
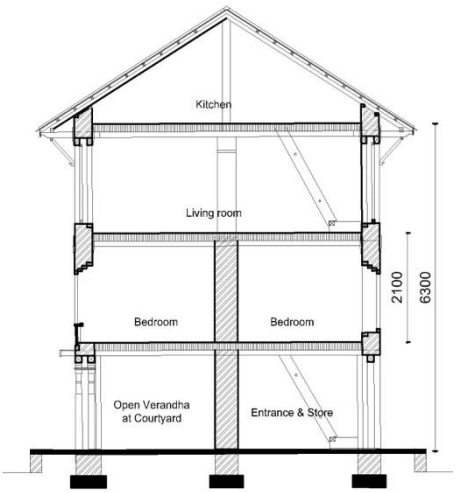


Figure 5.1 Traditional building Floor plan

Front View



Section

Figure 5.2 Traditional Building View and Section Detail

In the core urban area of Lalitpur, the responses regarding dwelling zones, dwelling type, and safety regarding building materials were positive. However, it was identified that more than 50 percent of houses were in row form of dwelling, more than 50 percent of the dwelling were situated at least 100 meters to 1 kilometer away from daily services and activities, and about 30 percent of individuals lived either in the non-vehicle alley or enclosed courtyard.

The non-vehicular access to the buildings obstructs movement during emergencies and physical difficulties, however, it still provides privacy and security to the elders. Vehicular access to the building gives easy access during an emergency but is chaotic, noisy, polluted, and unsafe for the elders. Moreover, the study also identified that almost 40 percent of the elderly citizens found it difficult to walk in the neighborhood due to high congestion, parked vehicles, and vehicular movement. For elderly citizens with extensively compromised physical strength, accessing the dwelling can be a challenge, thus resulting in detachment with neighborhood or outdoor spaces and isolation Likewise, having to travel a great distance to access services within the locality can result in higher dependence and restricts the mobility of elderly citizens (Yan, Gao, & Lyon, 2014). Currently, it has been reported that elderly citizens need to travel at least 5 to 15 minutes to access essential services and activities.

Another major problem associated with dwellings in non-vehicular narrow alleys row forms is a barrier to access to light and ventilation. Given the rise in haphazard building structures throughout the city, it is difficult for dwelling in core areas of Lalitpur to access light and ventilation. This holds even in the case of the courtyard. The tall building in close proximity and lack of ample space in housing has translated to compromise on access to sunlight and ventilation in the buildings as the majority of houses can access sun only through their rooftop or in some front-facing windows. This has also been portrayed in figures 5.3 and 5.4.

Additionally, penetration of the concept of a nuclear family in the area has resulted in vertical subdivision of the buildings, making people reluctant to build slender tall buildings in the limited land.

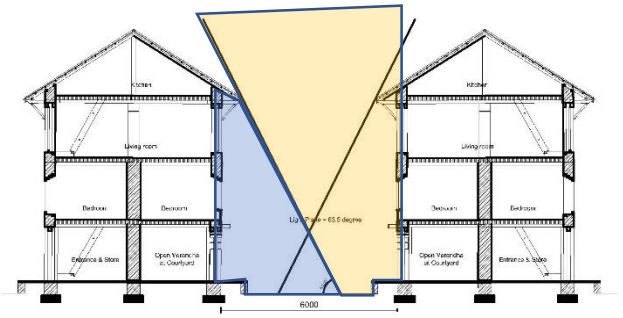


Figure 5.3 Sunlight in Traditional Courtyard

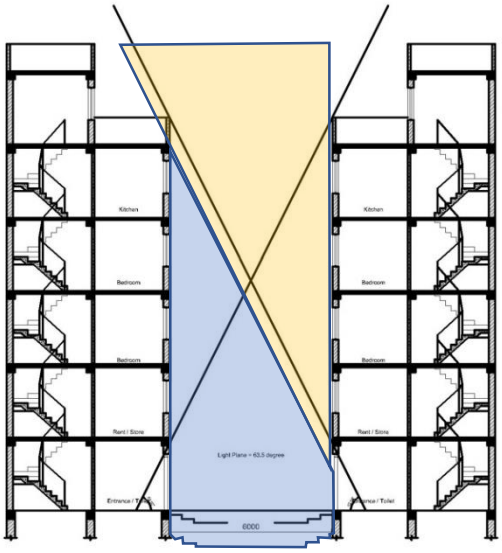
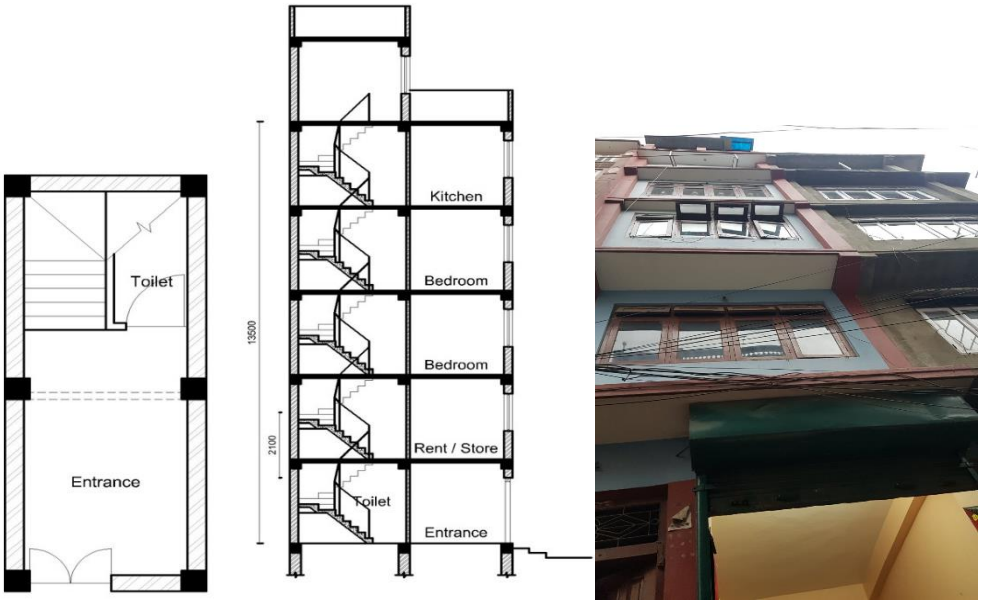


Figure 5.4 No Sunlight with tall buildings in same Courtyard



Floor Plan Section Front View

Figure 5.5 Modern Building floor plan, section details & view

The majority of dwellings in row form in Lalitpur have only one to two rooms per story limiting the mobility of elderly citizens within the house as shown in figure 5.5. 63 percent of respondents have three to four stories in their house and 32 percent respondents have more than 5 stories. 58 percent of respondents use three to four rooms, and 53 percent have bedrooms on the third floor. The majority of respondents suggested that it would be easier for them if all the rooms were on the same floor, including the kitchen and the toilet. Moreover, more than 40 percent of individuals were not satisfied with the staircase, due to physical tiredness caused by having to climb the stairs frequently, and lack of proper handrails to support their mobility on a staircase.

The current building structures in LMC have only one room and a small staircase area left after the subdivision. The elder citizens thus need to frequently use the staircase for access to rooms and services within the house. The elders are thus not satisfied with the scenario. Physical constraints and lack of proper handrails in the staircase have further exacerbated the issue. Moreover, the risk of accidents in the staircase is higher amongst older adults. Buildings with more than two-story are not recommended for old-aged individuals as such individuals are often constrained by their physical strength to frequently move inside their house. It diminishes their ability to access services within their house.

Moreover, the elderly population refrains from going out of the house for social purposes because of the difficulty in having to climb up higher story buildings and rooms to return to their houses. This not only affects the community participation of older citizens but also creates barriers to socializing within their house amongst family members.

The majority of respondents suggested that it would be easier for them if all the rooms were on the same floor, including the kitchen, bedroom, and toilet. However, such is not the case in Lalitpur. The elderly citizen often finds themselves dependent on others if mobility within the house is constrained. Table 5.1 shows the criteria for age-friendly housing & building and existing scenario of urban core area of Lalitpur. Thus, such a structure adds a burden on both the mental and physical health of older citizens, diminishing their quality of life.

Table 5.1 Criteria for Age-Friendly Housing & Building and Existing Status

SN	Factor	Literature	Existing	Inferences
1	*Dwelling Zones*	▪ Connectivity to essential services: daily groceries	▪ The essential services like groceries lies right beside the dwelling ▪ Within 5 to 15 min. walking distance	▪ Dwelling zones for elderly citizens are appropriate as the majority can access services through the commercial shops and service centers in the area ▪ The best reason to live in the core urban area
2	*Building Materials*	▪ Structurally sound	▪ Majority of elderly citizens feel secure regarding the building materials used	▪ Elders feel satisfied and safe building materials
		▪ Thermal comfort	▪ Many live in RCC Building	▪ Load bearing building better than RCC building
3	*Access to dwelling and Walkability*	▪ Easy access to the dwelling from street/road	▪ Narrow alley & closed courtyard restrict vehicular access to a dwelling	▪ Elderly citizen's access to emergency services like ambulances is difficult

SN	Factor	Literature	Existing	Inferences
			▪ Main road vehicular access to dwellings leads to chaotic, noisy, pollution, and unsafe	▪ Elderly refrain from coming out of their houses due to difficulty in accessing the dwelling, aggravating, loneliness
		▪ Pedestrian-friendly walkways with free of obstruction	▪ Difficult to walk due to high congestion ▪ Vehicular movement ▪ Obstruction from parked vehicles	▪ Elders need pedestrian-friendly walkways ▪ Planned or restricted vehicular movement ▪ Removal of chaotic vehicular parking
4	*Number of stories & Staircase mobility*	▪ More than 2 stories are not recommended	▪ Majority of elderly citizens live in more than 3 stories	▪ Higher-story buildings can have a negative impact on both the physical and mental health of elders
		▪ Wide & designed Stairwell	▪ Congested staircase well with high riser	▪ Accessing services to go up & down the staircase is difficult with deteriorating physical strength

SN	Factor	Literature	Existing	Inferences
		▪ Proper handrails	▪ Lack of proper handrails	▪ The risk of accidents and staircase injury will be higher
5	*Number of Rooms Used*	▪ Ease of accessing service within a house	▪ It is not easy to access services within a house as different rooms are on different stories	▪ Elderly citizens can find themselves confined to their room, which would bar them from social participation both within and outside the house
		▪ Ease of mobility within the house	▪ Slender tall buildings with only one room per story thus frequent use of staircase for mobility inside house	
6	*Access to Bedroom, Kitchen, and Toilet*	▪ One floor layout plan ▪ Prefer ground level bedroom, toilet, and Kitchen access	▪ Bedroom, kitchen, and toilet are situated on different stories ▪ Ground level is usually used for commercial or storage purposes	▪ Difficulty in mobility inside the house will also prevent active and independent ageing ▪ At least a small toilet on the bedroom floor
7	*Access to natural*	▪ Minimum 2-hour Sunlight in room	▪ No Sun light due to small window sizes	▪ Minimum access to sunlight can adversely affect the

SN	Factor	Literature	Existing	Inferences
	Light and Ventilation	▪ Fresh Air	▪ Obstruct from adjoining tall buildings ▪ Satisfied ventilation	health of elderly citizens ▪ Planned rooms are design with sufficient sunlight & natural cross ventilation

Thus, the findings suggest that the dwelling zones for elderly citizens are appropriate as the majority can access essential services right beside the dwelling or within 5 to 15 min. walking distance through the commercial shops and service centers in the area. However, the internal structure of the dwelling are less responsive to the requirements of age-friendly buildings and does not support active ageing in core urban area of Lalitpur.

5.3 Age-Friendly Outdoor and neighborhood spaces

One of the core requirement of an age-friendly city is age-friendly outdoor spaces and neighborhood that encourages elderly citizens to spend time outside their homes in the open (Oldenburg, 1989). It not only allows greater social participation but also allows the elderly population to conduct some form of physical activity in the open air. It is thus recommended for their physical, social, and psychological enhancement. Some of the imperative infrastructures for age-friendly outdoor spaces and neighborhoods are open spaces, sitting spaces, public toilets, and walkability.

Table 5.2 shows the criteria for age-friendly outdoor and neighborhood spaces and existing scenario of urban core area of Lalitpur.

Table 5.1 Criteria of Age-Friendly Outdoor and Neighborhood Spaces and Existing Status

SN	Factor	Literature	Existing	Inferences
1	*Public open spaces*	▪ Diversity in open spaces for socializing and rest ▪ Clean environment ▪ Green spaces	▪ Limited open space ▪ Encroachment of traditional open space ▪ Air & noise pollution due to unmanaged vehicles access	▪ Insufficient space for social participation can have an adverse impact on the mental health of the elderly and make them prone to loneliness, and depression
2	*Open spaces for exercise*	▪ Lots of open spaces within walking distance for physical activity	▪ No spaces for physical activities ▪ Street as only space for a morning walk	▪ Lack of open spaces for physical activity will further deteriorate the physical heath
3	*Public outdoor seating*	▪ Seating spaces at regular intervals ▪ Spaces to rest & rejoice	▪ Enclosed traditional seating spaces like patis ▪ Lack of spaces to sit, rest and socialize	▪ It might discourage elderly citizens from coming out of their houses and participating in the community
4	*Public Toilet*	▪ Clean well-maintained public toilets	▪ No public toilets	▪ The elderly citizens will have to travel back to their houses to access toilets, which might

SN	Factor	Literature	Existing	Inferences
		▪ Toilets at regular interval ▪ Disable friendly toilets		discourage them from coming out altogether
5	*Evacuation space*	▪ Adequate space for evacuation during disasters	▪ No space for evacuation ▪ City prone to earthquake	▪ Increased risk during natural calamities for elderly citizens
6	*Ease of walkability*	▪ Walkways that are free of obstructions ▪ Smooth surface	▪ Frequent obstructions from vehicular congestion ▪ Poor quality of roads ▪ No walkways	▪ Elderly citizens cannot easily walk in neighborhood which will have an adverse impact on both physical and mental health. ▪ Does not support active ageing

The study identified that 58 percent of respondents reported that their locality consists of a courtyard. Likewise, 32 percent, 18 percent, and 10 percent reported that they have access to patis and falcha, temple, and baha/bahi/nani as open spaces respectively. However, 10 percent respondents said that streets were the only open spaces available in their locality. Courtyard, patis and falcha, temple, and baha/bahi/nani are some of the structures that have been incorporated since the traditional design of Lalitpur city and worked as rest-houses. While in the past these spaces provided both a serene environment as well as space for seating outdoors and for social interaction, especially for the elderly population and children, the same cannot be implied today. The new generation has little interest in its relevance and preservation and thus does not cherish

such institutions. Thus, the majority of these places are filled with parked vehicles or are barred from access by incorporating walls or wooden doors that remain locked for most times of the year. Many of the places are encroached, enclosed, privatized, or dismantled. Thus, these structures do not serve the same purpose as they used to in earlier times. This suggests a lack of open spaces for elderly citizens to socialize. Consequently, 75 percent of respondents reported that their outdoor space did not consist of any sitting space.

Likewise, 54 percent of the respondent that there are no open spaces for exercise. Another major problem in the outdoor environment of Lalitpur was the lack of public toilets. 94 percent of respondents reported that they do not have any public toilets in their locality. Public toilets are essential for elderly citizens, and it is suggested that public toilets in age-friendly cities should also be disability friendly to facilitate the elderly citizens. Similarly, the study also identified that almost 40 percent of the elderly citizens found it difficult to walk in the neighborhood due to high congestion and vehicular movement.

Sallis (2009) recommended that open spaces conduct physical activity in the locality directly correlated with the healthy lifestyle of elderly citizens. Borst et al., (2009) and Crowe (2013) also highlighted that in addition to open spaces, ease of walkability, rest stations, and appropriate public toilets are also imperative facilities for elderly citizens. However, Lalitpur city lacks these services and attributes which makes it hostile towards elderly citizens.

5.4 Age-Friendly Social Participation, Community and Health Support

Table 5.3 shows the criteria for age-friendly social participation, community and heath support and existing scenario of urban core area of Lalitpur. It has been identified that venues for social interaction like libraries and entertainment areas are minimal in Lalitpur. Additionally, 85 percent of respondents reported that their localities did not consist of any daycare centers or clubs for socializing. The respondents in a core urban area of Lalitpur suggested that modifications that incorporated clinics, old-age day care, parks, a library, community hall, and sitting spaces in their locality are the most

desirable. Unavailability of such services in the neighborhood can discourage older individuals to spend time outside their houses, reducing social participation and physical activities. On the other hand, availability and access to such infrastructure can foster social interaction and help elderly citizens cope with isolation and loneliness (Alidoust, Bosman, & Holden, 2018). Such infrastructures help mitigate the problems of social isolation amongst the elderly population.

Table 5.2 Criteria of Age-Friendly Social Participation, Community and Heath Support and Existing Status

SN	Factor	Literature	Existing	Inferences
1	*Care and ageing well services*	▪ Adequate clinics, hospitals, first aid centers, and medical person ▪ Accessibility to daycare centers and old age homes	▪ Lack of adequate affordable health facilities ▪ Lack of daycare centers	▪ Elderly citizens will feel less safe & secure ▪ Living alone in a house brings loneliness, & depression
2	*Day club services*	▪ Gymnasium, library, swimming pool, parks and playground	▪ Day club services for elderly citizens are unavailable	▪ Elderly citizens do not have space for extra activities ▪ It will limit the outside interaction of the elders
3	*Community building*	▪ Community hall for community events and activities	▪ No community buildings for community events and participation	▪ Elderly citizens do not have space for socializing which might

SN	Factor	Literature	Existing	Inferences
		▪ Accessibility to social events		result in loneliness and active ageing

According to Aroogh and Shahboulagi (2020), community-based activities are essential aspects to improve the mental health of an ageing population. The Senior Citizens Rules 2008, and WHO (2007) also regard infrastructures and facilities like a gym, library, first aid center, access to medical professionals, old age homes, and day care centers as fundamental infrastructures of age-friendly cities.

Unavailability of health care services can expose elder citizens to a greater risk of mortality as this group of individuals are more prone to accidents and sickness. It also helps them feel secure and can have a phycological effect on boosting their confidence. Likewise, daycare centers have facilities especially targeted at older adults. Given the reluctance of elderly people in Lalitpur to migrate to other areas or old age homes, daycare centers can be the most plausible alternative whereby they have access to caretakers all day long, and they can also socialize with other individuals in the community and engage in different activities. Often a time, such spaces also consist of libraries and other facilities that the elderly population can enjoy.

For instance, Jyapu Samaj Jestha Nagarik Ananda Niketan, Bagdol, Lalipur provide such services to the elderly population. Jestha Nagarik Ananda Niketan is residential care for senior citizens located at Bagdol, Lalitpur built to serve the growing needs of an ageing population in Nepal. The institution provides quality healthcare, including communal activities for mental and physical well-being affiliation with Star Hospital, Sanepa. Its facility consists of auditoriums for praying, a learning hall, a library, yoga, and an exercise hall. The institution also provides other facilities or amenities like; ramp access, well-equipped medical poly clinic service, 24/7 nursing services, lift, laundry service, kitchen, dining, and wheelchair-friendly restrooms. Another imperative aspect is community halls and meeting spaces where the members can meet, socialize, plan

and conduct different activities. Such services enhance both the physical and mental well-being of the ageing population.

5.5 Age-Friendly Transportation

Easy access to transportation is also an imperative aspect of an age-friendly city (Friman, Lattman, & Olsson, 2020). However, the findings suggest that it is difficult to access public transportation in a core urban area of Lalitpur as it is in significant distance from the dwelling. Table 5.4 shows the criteria for age-friendly transportation and existing scenario of urban core area of Lalitpur. Only 21 percent of elders have access to a private vehicle. This implies that the majority of elderly citizens depend on public transportation to move to distant places. However, given the difficulty in accessing public transportation, the mobility of these adults has been restricted. One of the primary reasons behind the difficulty in accessing transport is the courtyard and narrow alley row form of dwelling which usually consists of narrow roads or non-vehicular alley that restricts the mobility of vehicles. Given the form of dwelling, the elderly population has to walk a certain distance even to access taxi services and public transportation. Another significant problem is the lack of parking spaces and high congestion in the city.

Table 5.3 Criteria of Age-Friendly Transportation and Existing Status

SN	Factor	Literature	Existing	Inferences
1	*Mode of transport*	▪ Public transport	▪ Majority use public transport	▪ Given the declining physical abilities, it is safer for older adults to travel through public transport
2	*Vehicle movement in*	▪ Well managed	▪ High traffic congestion	▪ It might discourage elderly citizens

SN	Factor	Literature	Existing	Inferences
	the neighborhood	▪ Ease of walkability	▪ Obstructs walkability	from coming out of their houses
3	*Easy access to public transport*	▪ Affordable ▪ Accessible frequently ▪ Old age-friendly services	▪ Not easily accessible and affordable ▪ Road along with public transport does not support elderly citizens	▪ Will restrict mobility of elderly citizens for both essential services as well as social participation ▪ Can have a negative impact on physical and mental health ▪ Will make elderly citizens highly dependent and discourage active ageing

Given the same, the elderly population will not just face barriers in socializing with distant friends and families, but also will find it exceptionally difficult to travel during emergencies. The narrow roads also bar access to ambulance services in all parts of the city. Apart from the availability of public transport in the city, it is also important to ensure the quality and affordability of transport services. Green, Jones, and Roberts (2014) identified that easy access to transportation services provides opportunities for older citizens to interact with other members and enhance their social life and reduce social exclusion.

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

With an increase in the ageing population in Nepal, there is a need for adaptable architecture and age-friendly built environments for active aging people that would allow them to live longer healthier, safer, and more independent lives. The major objective of this study was thus to: access the notion of ageing in place among older individuals; identify the current condition of different imperative domains of age-friendly cities – housing, building, outdoor and neighborhood spaces, transportation, public spaces; and analyze whether the current core urban city can promote independent and active ageing amongst the older population.

6.1 The notion of Ageing in Place

With the descriptive analysis of data collected from 112 citizens who lived in a core urban area of LMC and who belonged to the age group of 60 and above, the findings of the study revealed that the elderly population in LMC has a strong notion of ageing in place. The majority of individuals feel highly attached to their locality and do not intend to migrate. The reason behind the refrainment from migrating is the mere fact that they have lived there for a prolonged period of time and have a sense of belongingness towards their locality and neighbors. This suggests that the individuals in Lalitpur would prefer to age in place rather than age in a new place, elderly homes, or age-care centers. Thus, it is imperative for the city to have an age-friendly built environment to facilitate the active ageing of such elders.

However, the study revealed that the current built environment, which includes housing, building, outdoor spaces and neighborhood, community and health support, and transportation, is inadequate to facilitate the independence of the active older population and to enhance both their well-being and quality of life.

6.2 Age-Friendly Housing and Building

Some of the most prominent gaps identified by this study in terms of age-friendly housing and building were difficulty in accessing the dwelling from narrow alleys,

slender tall buildings with only one room per story which required older individuals to frequently use staircases thus limiting their mobility, lack of access to sunlight and ventilation in the dwelling, difficulty in accessing basic services within the house like kitchen and toilet.

6.3 Age-Friendly Outdoor and neighborhood spaces

The gaps identified in the case of outdoor and neighborhood spaces in Lalitpur were lacking critical infrastructures like open space, seating areas for social participation and rest, public toilets, and venues for entertainment and community activities. Additionally, the elderly population perceives the city as hostile towards the elderly citizens as walking around the neighborhood is difficult, mostly due to traffic congestion.

6.4 Age-Friendly Social Participation, Community and Health Support

The accessibility to social, community, and health support were equally poor as Lalitpur lacks community halls, entertainment and meeting spaces for elderly citizens, spaces where elderly citizen can exercise their skill and knowledge, and daycare centers.

6.5 Age-Friendly Transportation

The elderly population also finds it exceptionally difficult to access public transport in the city. The major challenges faced by these individuals are that they must walk a long distance to access public transport, and neither can they bring a private vehicle to their doorsteps.

This suggests that the current built environment in Lalitpur does not support the active and independent ageing of elderly citizens. Additionally, the elders refraining from mobility both within and outside the house leads to elder's isolation, loneliness, and depression. The city thus needs to invest in policies and infrastructures to enable the same.

In accordance with the findings of this study, numerous recommendations can be generated for architects, as well as the government in Lalitpur as well as other rapidly urbanizing cities, which are as follows:

- The architects and planners have a major role in ensuring that housing structures are age-friendly. Given the same, architects and planners should design building structures considering imperative aspects of age friendly built environment like: access to building, appropriate stairwell design incorporating proper handrails, plan and design floor plans with essential rooms like bedroom, kitchen, and toilet on the same floor, ease of mobility within the house, location of bedroom, minimize elder's vertical mobility, and provides sufficient natural sunlight & cross ventilation.
- The planners and architects should ensure the preservation and addition of outdoor places that consist of seating spaces for the elderly population while designing both public and private structures.
- The architects and planners should ensure that the daycare centers and old age homes have all required facilities as mandated by the Senior Citizens Act 2008.
- The local governments should introduce a housing guideline for facilitating active ageing, such that, new houses and houses that require modifications should follow the guideline while new construction.
- The local government should devise policies to protect and preserve the traditional structures like pati, falcha, courtyards among others. One imperative move can be to restrict parking in courtyards during the daytime.
- The local government should invest in public toilets, building parks, and areas for elderly people to meet as well as conduct physical exercise. These spaces can also be used as evacuation spaces during natural calamities.
- The local government should invest in proper road maintenance and should work towards managing traffic congestion in the core urban areas.
- The local governments should promote individuals or stakeholders to open daycare centers for old aged individuals who cannot afford to modify their houses and do not want to migrate from the location.

- The local government should ensure accessibility and affordability of public transport in the core urban area.
- The local government as well as architects and planners should work together in segregating spaces for parking vehicles in the city.
- Rapidly urbanizing cities should start proper zoning of residential areas and introduce housing guidelines to prevent such oversight.

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ANNEX

Annex 1: SAMPLE QUESTIONS (English)

Socio - Demographic Information:

1) Name : ……..

2) Religion :…….

3) Sex:
   Men ☐ Women ☐ Other ☐

4) Education:
   Basic (can read & write) ☐ Primary ☐
   SLC ☐ Higher ☐

5) Age:
   60 - 65 ☐ 66 - 70 ☐
   71 - 75 ☐

6) Marital Status:
   Married ☐ Unmarried ☐
   Widow/widower ☐

7) Previous Employment:
   Government ☐ Semi-government ☐
   Private/Business ☐ Agriculture ☐
   Other……

8) Living Arrangements:
   Alone ☐ With partner ☐
   With Others ☐

9) House ownership:
   Own ☐ Rent ☐

   Location: …….. Ward No.: ……..

10) Monthly Expenses:
   Pension ☐ Property rent ☐
   Family Support ☐ Allowance ☐
   Other……

11) Self rated health:
- Excellent ☐ Good ☐
- Poor ☐

12) Any chronic diseases like:
- Diabetic ☐ Heart diseases ☐
- Arthritis (joint pain) ☐ Mental health related problem ☐
- Other……

Physical Detail - Observation:

13) Building in which zones:
- Residential ☐ Commercial ☐
- Residential + commercial ☐

14) Dwelling form:
- Row ☐ Courtyard ☐
- Individual ☐

15) Types of dwelling:
- Load bearing ☐ RCC ☐
- Temporary ☐
- Other……..

16) Number of storey:
- 1 - 2 stories ☐ 3 - 4 stories ☐
- 5+ stories ☐

17) Daily needs activities within:
- Near Home ☐ 500m – 1km radius ☐
- 500m – 100 ☐
- Other……..

18) Bedroom (in which floor):
- Ground floor ☐ 1 floor ☐
- 2 floor ☐ Other……..

19) How many numbers of rooms are you using:
- 1-2 room ☐ 3-4 rooms ☐

more than 4 ☐
Other……..

20) How long are you living in this locality:

1 - 5 years ☐ 6 - 10 years ☐
> 10 years ☐ born there ☐

21) Primary access to the building :

Main road ☐ Courtyard ☐
Residential Street ☐ Non-vehicle - Alley ☐

Building:

1) Are you satisfied with the current location of your building?

Yes ☐ Little ☐ No ☐

2) Are you satisfied with the room, Kitchen location in your building?

Yes ☐ Little ☐ No ☐

3) Are you satisfied with the toilet location in your building?

Yes ☐ Little ☐ No ☐

4) Are you satisfied with the staircase in your building?

Yes ☐ Little ☐ No ☐

5) Are you satisfied with the natural light & ventilation in your building?

Yes ☐ Little ☐ No ☐

6) Do you feel safe in your building regarding building material used?

Yes ☐ Little ☐ No ☐

If no, what do you preferred?

Load Bearing ☐ RCC ☐ Metal Post ☐

7) Do you think the height of the building effects the security and safety in building?

Yes ☐ Little ☐ No ☐

8) Do you have roof top garden or small bari in your building?

Yes ☐ Little ☐ No ☐

If no, do you preferred?

Yes ☐ Little ☐ No ☐

9) Do you prefer to have a shop in your building?

Yes ☐ Little ☐ No ☐

For what purpose (economic/gathering)? …….

Immediate Neighborhood:

10) Are you satisfied with the neighborhood (pollution, noise, friendliness, help)?

Yes ☐ Little ☐ No ☐

If yes what makes it satisfactory?

Helpful /friendly ☐ Close to public transport ☐

Social interacting space (Temple) ☐ Provision of open space (Courtyards) ☐

Others……

If no what makes it dissatisfactory?

Not Helpful /friendly ☐ Noise pollution ☐

Commercialized space ☐ Security issues ☐

Others……

11) How attached do you feel towards your neighborhood?

Yes ☐ Little ☐ No ☐

12) Do you feel personal safety in your neighborhood?

Yes ☐ Little ☐ No ☐

13) The public transportation stops are accessible or not?

Yes ☐ Little ☐ No ☐

14) Are there any public outdoor seating spaces in your neighborhood?

Yes ☐ Little ☐ No ☐

15) Are there any public toilet in your neighborhood?

Yes ☐ Little ☐ No ☐

16) Are there any care and aging well services in your neighborhood?

☐ ☐ ☐

Yes Little No

If no, what do you preferred?

……

17) Do you prefer CCTV in the neighborhood for security?

Yes ☐ May be ☐ ☐No

18) Do you have evacuation spaces for natural calamities like earthquake in the neighborhood?

Yes ☐ May be ☐ ☐No

If no, do you prefer?

Yes☐ May be ☐ ☐No

19) Amount of vechicle movement in the neighbourhood:

Heavy ☐ Medium ☐
Light ☐ None ☐

20) Types of transport forms that you use mostly:

Walk ☐ Public Transport ☐
Bike/Scooter ☐ Car ☐

21) Do you feel safe/comfort while walking in street, road, and alley of neighborhood?

Yes ☐ Little ☐ No ☐

If no, what do you think has caused discomfort for you to walk around the Neighborhood?

Congestion ☐ Vehicles ☐
Parking ☐
other……

Social interaction:

22) Do you use public spaces in your neighborhood (baha, chowk, streets) for social activities?

Yes ☐ No ☐

23) For what purpose do you use the neighborhood public space (Courtyards)?

Gathering ☐ Sun basking ☐ Yoga/exercise ☐

Commercial purpose ☐ Don"t use at all ☐ Other …….

24) At what time / How often do you gather with your age group daily?

Yes ☐ No ☐

where, Courtyard/patis/falcha/shops …….

Group size ……

25) What is the current condition of these social outdoor spaces (courtyard, patis, falcha & others)?

Good ☐ Fair ☐ Poor ☐

What do you prefer for improvement?

……

26) Do you prefer Mixing and socializing with children?

Yes ☐ Little ☐ No ☐

27) Do you have open spaces (for daily exercise) in your neighborhood?

Yes ☐ Little ☐ No ☐

28) Do you have day club spaces in your neighborhood?

Yes ☐ Little ☐ No ☐

Do you prefer to go to day club?

Yes ☐ Little ☐ No ☐

29) Do you have variety of cultural activities, program & function within your neighborhood?

Yes ☐ Little ☐ No ☐

30) Do you participate in these activities?

Yes ☐ Little ☐ No ☐

How do you feel? ……..proud/Happy/value member of society ……..

31) Do you feel a valued member of the society?

Yes ☐ No ☐

If yes, how……..

If no, what can be done to make it better? …….

32) Do you have library, entertainment venues, and social club (new hobbies, passions) spaces in your neighborhood?

Yes ☐ Little ☐ No ☐

Do you prefer to go to these areas?

Yes ☐ Little ☐ No ☐

33) Do you have opportunities to participate in decision-making bodies such as community councils or committees?

Yes ☐ No ☐

Do you prefer it?

Yes ☐ No ☐

34) Do you think there should be policies to have equal opportunity to work for as long as they want or need to regardless of their age?

Yes ☐ No ☐

Future Planning & Suggestion:

1) Do you need modification in the building?

Yes ☐ May be ☐ No ☐

if yes, what is to modified?

Door/Window ☐ Kitchen ☐ Balcony ☐

Staircase ☐ Toilet ☐ Room size ☐

Others …….

2) Are you planning to move from this location (migration)?

Yes ☐ May be ☐ No ☐

if yes, Reason for moving?

New Lifestyle ☐ Facilities: Garden, Maintenance, Hospital ☐

People with similar age ☐ Close to family/friends ☐

Others …….

if No, Reason for not moving?

Living for life time ☐ House design/layout ☐

Easy access to services ☐ Friendly neighborhood ☐

Location ☐ Safe and Security ☐

Others …….

3) Do you need modification in the neighbourhood?

Yes ☐ May be ☐ No ☐

if yes, what is to modified?

Parks ☐ Library ☐ Community Hall ☐

Courtyard ☐ Clinic ☐ Foothpath ☐

Others …….

Annex 2: SAMPLE QUESTIONS (Nepali)

नाम थर:	टोल:.....

धर्म: .....

१. लिङ्ग
पुरुष □ महिला □

२. उमेर
६०-६५ □ ६६-७० □ ७१-७५ □

३. वैवाहिक स्थिति
विवाहित □ अविवाहित □ एकल □

४. शिक्षा
साधारण लेखपढ □ प्राथमिक तह □ माध्यमिक तह □ अन्य:.....

५. पेशा
सरकारी □ अर्ध सरकारी □ निजि व्यवसाय □ कृषि □ अन्य:.....

६. बस्ने घर
आफ्नै □ डेरा □ अन्य:.....
टोल..... वडा.....

७. को सँग बस्नु हुन्छ?
एकलै □ बुढा/बुढी □

८. आम्दानीको श्रोत
पेन्सन □ घरभाडा □ व्यापार व्यवसाय □ अन्य:.....

९. कुनै प्रकारको रोग
मधुमेह □ उच्च रक्तचाप □ नसा सम्बन्धि □ अन्य:.....

१०. घर कुन क्षेत्रमा पर्दछ?
आवासीय □ व्यापारिक □ दुवै □

११. घरको बनावट
अलगै □ जोडीएको □ चोक भित्र □

१२. घरको किसिम

माटो+ईटा □ ढलान □ अन्य:.....

१३. घरको तल्ला
१-२ तल्ला □ ३-४ तल्ला □ ५ भन्दा माथि □

१४. दैनिक आवश्यक सामान लिन कति टाढा जान पर्छ?
१ कि.मि. □ ५०० मि.-१००मि. □ घरसँगै □

१५. सुत्ने कोठा कति तल्लामा छ?
१ तल्ला □ २ तल्ला □ ३ तल्ला □

१६. कति वटा कोठा चलाउनु हुन्छ?
२-३ वटा □ ४-५ वटा □ ६-८ वटा □

१७. यस ठाउँमा बस्नु भएको कति वर्ष भयो?
५-१० वर्ष □ जन्म थलो □

१८. घर जाने बाटो
मूल सडक □ आवासीय सडक □ गल्ली □ चोक □

१९. तपाईलाई यो ठाउँ ठिक छ?
छ □ छैन □

२०. तपाईको घरको कोठा, भान्छा, बाथरुमको वनावट ठिक छ?
छ □ छैन □

२१. घरको भर्याङ्ग: तल माथि गर्न सजिलो छ?
छ □ छैन □

२२. घरमा घामको उज्यालो र हावा छिर्छ की छिर्दैन?
छिर्छ □ छिर्दैन □

२३. तपाईलाई कस्तो घर मन पर्छ?
ईटा र माटोले बनेको □ ढलान □ अन्य:.....

२४. तपाईको घरमा बारी वा कौसी खेती गर्ने ठाउँ छ?
छ □ छैन □

२५. तपाईको घरमा पसल छ?
छ □ छैन □

२६. तपाईको छिमेकीसँगको सम्बन्ध नजिक छ?
छ □ छैन □

२७. तपाईको घर नजिक के मन पर्छ?
चोक □ सहयोगी छिमेकी □ मन्दिर □ सार्वजनिक यातायात □

२८. तपाईलाई घर नजिक मन नपर्ने कुरा के हो?
व्यापारिक स्थल □ होहल्ला □ असुरक्षित गतिविधि □

२९. सार्वजनिक यातायात बस स्टप नजिक छ कि छैन?
छ □ छैन □

३०. तपाईको घर आँगनमा छिमेकीसँग बस्नलाई कुर्सि छ?
छ □ छैन □

३१. तपाईको टोल छिमेकमा सार्वजनिक शौचालय छ?
छ □ छैन □

३२. तपाईको समुदायमा जेष्ठ नागरिक सेवा केन्द्र छ?
छ □ छैन □

३३. जेष्ठ नागरिक सेवा केन्द्र चाहिन्छ की चाहिँदैन?
चाहिन्छ □ चाहिँदैन □

३४. तपाईको समुदायमा प्राकृतिक प्रकोपमा जाने ठाउँ छ?
छ □ छैन □

३५. तपाई कुन यातायात साधान प्रयोग गर्नु हुन्छ?
मोटर साइकल □ सार्वजनिक बस □ टेप्पो □ हिड्ने □

३६. तपाईको छरछिमेकीसँग भेटघाट गर्ने ठाउँ छ?
छ □ छैन □
छ भने के छ? चोक □ पाटि □ जेष्ठ नागरिक दिवा सेवा केन्द्र □

३७. कुन समयमा छरछिमेकीसँग भेटघाट गर्न जानु हुन्छ?
विहान □ दिउँसो □ साँझ □

३८. तपाईको छिमेकीसँग भेछघाट गर्ने ठाउँ कस्तो छ?

राम्रो □ ठिकै □ सुधार गर्नुपर्ने □

राम्रो पार्न के गर्न सकिन्छ?.....

३९. तपाईलाई बालबालिकाहरुसँग घुलमिल हुने इच्छा छ?

छ □ छैन □

४०. दैनिक व्यायाम गर्ने ठाउँ छ?

छ □ छैन □

४१. तपाईको समुदायमा कुनै प्रकारको सामाजिक कार्यक्रम हुन्छ?

हुन्छ □ हुँदैन □

४२. तपाई त्यस कार्यक्रममा भाग लिनु हुन्छ?

लिन्छु □ लिन्न □

४३. तपाई आफूलाई आफ्नो समाजको सक्रिय सदस्य भन्ने सोच्नु हुन्छ?

सोच्छु □ सोच्दिन □

४४. तपाई आफ्नो समाजको लागि केहि गर्न चाहनु हुन्छ?

चाहन्छु □ चाहदिन □

४५. तपाईको विचारमा उमेर हद नलागि आफूले गर्न सकेसम्म काम गर्न पाउने नीति नियम हुनु पर्छ जस्तो लाग्छ?

लाग्छ □ लाग्दैन □

४६. तपाईको घरको बनावटमा परिवर्तन गर्ने इच्छा छ?

छ □ छैन □

छ भने? झ्याल □ भान्छा □ भर्याङ्ग □ ट्वाइलेट □ बाथरुम □

४७. तपाई नयाँ ठाउँमा सर्ने योजना छ?

छ □ छैन □

छ भने किन? नयाँ रहन सहन □ आफू सरह साथीहरु □ परिवार □ बगैचा □ अस्पताल □

छैन भने किन? जन्म थलो □ सुरक्षित □ असल छिमेकी □ आवश्यक सबै □ अस्पताल □

४८. आफ्नो समुदायमा कुनै परिवर्तन होस भन्ने चहानु हुन्छ?

Annex 3: SAMPLE QUESTIONS - Local Club, Old age Club, Guthi, Local leader, Experts

Name:

Organization:

Post:

1) How long have you been working in senior industry?
   जेष्ठ नागरिकको क्षेत्रमा काम गर्नु भएको कति भयो?
2) What do you think about the present built environment of active elders living in the core urban area of Lalitpur?
   ललितपुरका भित्री शहरी वस्तीका शक्रिय जेष्ठ नागरिकहरुले उपयोग गरिरहनु भएको भौतिक वातावरण कस्तो पाउनु भएको छ?
3) What are the general buildings situation for active elders?
   शक्रिय जेष्ठ नागरिकहरु वसोवास गरिरहनु भएको आवसको भौतिक अवस्था कस्तो पाउनु भएको छ?
4) What are neighborhood situation for active elders?
   शक्रिय जेष्ठ नागरिकहरुको छरछिमेको वातावरण को अवस्था कस्तो पाउनु भएको छ?
5) What are the social spaces present in neighborhood that helps to keep the elders active both mentally and physically?
   शक्रिय जेष्ठ नागरिकहरुको शाररिक तथा मानसिक अवस्था दुरुस्त राख्नको लागि छरछिमेकमा कस्तो खालको सामिजिक पूर्वाधार सुविधा उपलब्ध छ?
6) What are the gaps that need to be fulfill in future built and neighborhood planning?
   तपाईको नजरमा, भविष्यमा गरिने भौतिक र छरछिमेकको वातावरण योजनालाई सवल बनाउन के-के सुधार गर्न आवश्यक छ?
7) How do you see the current development of day care center, retire homes and Old age home in Lalitpur?
   ललितपुरमा रहेका दिवा हेरचाह केन्द्र, सेवानिवृत्त भवन र वृद्धाश्रमको विकासको क्रम कस्तो पाउनु भएको छ?

   Day care center:

   हेरचाह केन्द्र:

   Retire Homes:

   सेवानिवृत्त भवन:

   Old age home:

   वृद्धाश्रम:

8) Do you expect more support from the government for the age in places for core area's active elder? (except allowance)
   सरकारको तर्फबाट शक्रिय जेष्ठ नागरिकहरुको लागि थप सेवा सुविधा उपलब्ध गराउन आवश्यक देख्नुहुन्छ?
9) What are your expectations for future Senior Living environment?
   शक्रिय जेष्ठ नागरिकहरुको लागि भविष्यमा के-कस्त भौतिक एवं सामाजिक वातावरण निर्मित होस भन्ने अपेक्षा राख्नु हुन्छ?

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The notion of Ageing in Place and Age-Friendly Housing in Core Urban Area of Lalitpur

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Abstract
This paper aims to study the notion of ageing in place amongst the active elders in the core urban area of Lalitpur and focuses on elders living alone or with spouse. Furthermore, this study also aims to identify the current condition of housing structure that is imperative for an age-friendly city and analyze whether the current city is able to promote independent and active ageing amongst the older population. This study conducted descriptive analysis on data collected through a structured questionnaire and interviews with 112 active elders using snowball-sampling technique. The findings of the study established that the elderly citizens residing in core urban area of Lalitpur had a strong notion of ageing in place, with majority feeling attached to their locality and refraining from migrating to any other area. However, the study revealed that the current housing and building structure of the area do not meet the requirements of age-friendly housing. The factors like easy access to dwelling, ease of walkability, mobility within the house, access to basic needs like toilet and bedroom, and access to sufficient sunlight and natural ventilation in their building were particularly challenged. The study concluded that Lalitpur and other rapidly urbanizing areas should devise a housing guideline to facilitate active ageing.

Keywords
Active Ageing, Age Friendly Housing, Ageing in Place, Built Environment, Core urban area

1. Introduction

All countries around the globe are witnessing a growing concentration of older people. The World Population Prospects 2019 published by United Nations reported that, for the first time in 2018, number of persons aged 65 or above outnumbered children under five years old [1]. United Nations highlighted that older population in Asia will increase from merely 9 percent in 2006 to 24 percent in 2050 [2].

Many studies around the globe have confirmed that older citizens face higher number of challenges in both built environment and social facets of life as ageing compromises their ability to manage everyday life. The decline in physical as well as mental capacity has adverse impact on the ability of the population to live an independent and active life, substantiating the need of age-friendly built environment. With regards to the same, numerous studies as well as organizations around the globe have concentrated their efforts in improving built environment to make it friendlier for older population.

Built environment can be referred to as man-made spaces, including but not limited to, house, workplace, school, library, hospital, care facilities, streets, transportation, and other outdoor spaces. It can be attributed to a variety of structure from unit, block, and housing to neighborhood and city [3]. Given proper structuring and design of the aforementioned spaces, it can have a significant positive impact on the wellbeing and quality of life of the older aged population [4]. It has been identified that, the built environments that have positive influence on the overall physical and mental health of elders prevents social isolation, signs of depression and loneliness, danger of mortality, falls, and hospitalization amongst the old-aged citizens.The problem of ageing population and the subsequent need of age-friendly built environment is equally relevant in the context of Nepal. Figure 1 shows that in Nepal population under 5yrs children is decreasing while aging population increasing from 2001 A.D. to 2050A.D. Similarly, people belonging to the age group of 60 and above

comprises of 8.1 percent of the overall population of Nepal [5].

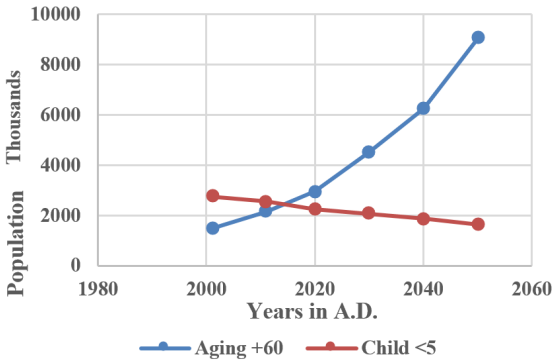

Figure 1: Aging population of Nepal [5]

The Central Bureau of Statistics estimates that the older population in Nepal are likely to reach 3.4 million by 2031[6]. However, studies have identified that healthy ageing in Nepal is challenging as the built environment does not meet the desired requirements essential for the older population [7]. This holds especially true for rapidly growing urban areas like core cities in Kathmandu Valley, where the aging population have instigated a feeling of insecurity, isolation, and lack of confidence. These group are prone to become dependent due to fear of living alone in the rapidly transforming environment from traditional to modern.

The physical and mental strain of ageing citizens in urban areas is attributable to loss of spatial built environment, congested accessibility, and crowdedness[8]. The need of modern high-rise concrete buildings in small plots, congested roads, encroached courtyards, and vehicle parking at public spaces has hindered the likelihood of active and independent ageing amongst older people [9].

This study thus attempts to assess the notion of ageing in place and analyze whether the current housing structure are age-friendly in core urban area of Lalitpur Metropolitan City (LMC).

1.1 Objectives

The major objective of this study are to:

- Examine whether the notion of ageing in place exists amongst the ageing population in core urban area of LMC.
- Analyze whether the current housing and building structure in core urban area of LMC are suitable for independent and active ageing.

1.2 Scope and Limitations

The findings of this study can be extended to core urban areas like LMC or other potential urban geographical regions with comparable characteristics. However, this article does not cover other imperative domain of age-friendly built environment like neighborhood, outdoor spaces, transportation, among others.

The methodology of this study is mostly descriptive in nature which does not provide evidence to cause and effect relation between the factors and active ageing. This study is based on perception of individuals between 60 to 75 years old who are free of any serious health disorders. It does not provide solutions for elders who need constant support, care, and medication.

2. Literature Review

Organizations like WHO have been aggressively working towards building age friendly environment since early 2000s. Some of the initiatives of WHO include ”Active Ageing: A policy framework” introduced in 2002 and ”Global Age Friendly Cities: A guide” introduced in 2007.The policies are based on the principles of independence, security, participation, health, and other aspects in environment that empowers aging population to live actively and independently. ‘Active aging’ simply refers to as healthy and successful ageing. Active ageing implies a lifestyle that helps older population live actively without loss of basic abilities, and which leads to mitigation of vulnerability towards old age diseases and disability[10]. For the same, WHO has introduced eight domains that considers a city age-friendly – housing, outdoor spaces and public building, social participation, respect and social inclusion, civic participation and employment, communication and information, community support, and health services [11].

While policies related to built environment of aging population are being implemented worldwide, it is recommended that it is of utmost importance to consider the preference of aging population – whether to age in their respective homes and communities or in elder citizen homes. The major aim of such policies is to ensure active aging through built environment that facilitates in enhancing the ability of ageing population to live independently in their houses and communities. Such environment is deemed necessary

to enhance the quality of life and wellbeing of adults.

2.1 The notion of Ageing in Place

The demographic preferences of ageing population to age in their own homes and communities are widespread throughout the world [12]. Despite deteriorating conditions of mobility, visibility, hearing, and cognitive and mental abilities, older population still desire to continue to live in their own homes and localities. Ageing in place would allow older adults to live in a familiar setting which could enhance their emotional and mental health [13]. Older population who have resided in a place for a longer time build a sense of attachment to the locality which make them refrain from migrating to areas with better services for older population [14]. Living in the locality helps preserve their sense of identity as well as independence[13].

However, while ageing in place allows older adults to retain connections with their community, family, and friends, in cities experiencing rapid urbanization, the rapid changes in the environment can be hostile towards older population and thus it might create barriers for active ageing [15]. Thus, utmost care should be given while designing the city with due consideration to ageing population.

Buildings and outdoor spaces that are designed with age-friendly features can help alleviate the need to shift older population to age care facilities and allow them to age in their respective places [16].

2.2 Age-Friendly Housing and Buildings

Age-friendly housing is the most important domain as it allows older people to age in place without losing autonomy and independence [17]. The rationale behind age friendly housing is to enhance accessibility and mobility of elderly citizens inside the house such that they can live independently and comfortably [18]. Built environment significantly correlates with healthy lifestyle and majority of old aged individuals desired for better houses than those with excellent health condition [19]. The factor behind the preference is the mere fact that older population need higher physical and mental support due to their deteriorating health condition.

Numerous organizations like by WHO and other age-friendly housing guidelines published by Livable Housing Australia, RIBA [20], among others, have introduced a criterion for age friendly housing.

According to WHO, the requirements for age friendly housing and building includes [11]:

- Connectivity to essential services.
- Design that includes sufficient space for free movement, wide passages, and appropriately designed toilets and kitchen, among others.

Likewise, some of the aspects considered as imperative by the Livable Housing Australia are as follows [21]:

- Access to dwelling.
- Easy access to toilet.
- Ease of mobility in staircase to avoid injuries, among others.

Senior Citizens Rules, 2008 of Nepal, particularly designed for age care homes, give higher emphasis on ventilation and sunlight [22].

Some of the common attributes in these houses and buildings that are compatible for Nepal are easy access to dwelling, easy access to essential services, easy access to kitchen and toilet, easy staircase mobility, and ample access to light and ventilation.

Studies have reported that essential services used by elderly citizens in their everyday life like clinics, grocery store, transport stations, and other services should be within proximity to the dwelling [23]. Given ample amount of space between the dwelling and essential services can result in higher dependence and restricted mobility, diminishing the capacity of elderly citizens to live an independent life. Likewise, easy access to dwelling is also essential to ensure that elderly citizens are able to enter into their building without overcoming any obstacles [24]. Vehicular access to dwelling is also an important aspect as elderly population are most prone to emergencies which require immediate medical or other type of attention. Ease of mobility is equally important within the building of residence [25]. For the same, one floor or ground floor layout with all rooms and services within the same floor is desired for older population. Having to access rooms located at different stories of building requires elderly citizens to use staircase frequently. While it might provide some form of exercise to ageing population, elderly citizens with limited physical capacity will find themselves confined to their room as frequent staircase mobility will significantly strain their body [26]. Given the same, higher storied buildings can not only be physically difficult but also will equally affect the mental health of the population. WHO and other

housing guidelines has thus promoted one floor layout and staircase with proper handrails. The studies have also reported that elderly citizens are more prone to staircase accidents. Likewise, access to light and ventilation are imperative during old age. Older populations are recommended to position their bedrooms in location that receives ample sunlight[27]. While at that, it is important to protect elderly citizens from being exposed to air and noise pollution, which can be difficult in core urban areas. These aspects of housing design are considered to have significant effect on the ability of elderly citizens to live comfortably as it enhances accessibility and adaptability of housing and buildings and mobility within the houses.

3. Study Area

Lalitpur, a city experiencing rapid urbanization, is reported to be the oldest city of Kathmandu Valley. The city had two housing patterns: symmetrical linear and courtyard form houses. Average houses were constructed in rectangular plan with about 6m depth, and varying length. Generally, the houses were of three stories, and have sloped roofs built with mud and mortar. The natural lighting, ventilation, and low clear floor height served the ancient lifestyle and the houses did not have bathrooms inside. The elderly population were looked after by their children. It uniquely contributed to both physical and mental wellbeing of the growing population.

Figure 2: Map of Study Area, Lalitpur, Nepal

In the past two decades, Lalitpur city has experienced substantial changes in demography, way of living, and built environment. More importantly, the transformation of the traditional joint family culture to a nuclear family along with the vertical and horizontal subdivision of traditional houses between family members has led to insufficient living spaces for all family members. A general observation suggests that the changes are having adverse impact on the older population as criteria for making age-friendly houses are often neglected or encroached upon while building new structures.

4. Methodology

This study has employed qualitative research method and descriptive statistics to ascertain the notion of ageing in place and to analyze the current housing and building structures in LMC.

This study is based on primary data collected from 112 respondents through structured questionnaire. The sample, who were above 60 years of age and reside in core urban area of LMC - alone or with spouse, were identified through snowball sampling. Snowball sampling is a non-probability sampling method which is used to identify samples which have traits and are not commonly found. In such type of sampling, the initial samples, identified purposively, provide referral to identify additional samples relevant for the study[28].

5. Analysis

5.1 The notion of Ageing in Place

The notion of ageing in place is a broad concept that encompasses the personal attachment of an individual towards a place that allows people belonging to old age groups attain a sense of identity and independence. Under this notion, older individuals desire to continue living in their homes and neighborhood despite their deteriorating physical health, mental health, mobility, and access to services.

5.1.1 Length of Residency:

Figure 3 depicts that majority respondents, that represented 51 percent of total respondents, have been living in the locality for more than 10 years. Likewise, a significant number of respondents (38 percent) have been living in the locality since their birth. Only 2 percent of respondents had been living there for less than 5 years.

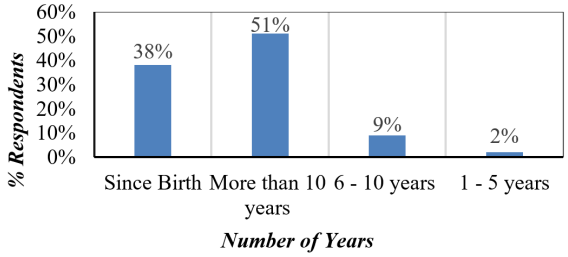

Figure 3: Length of Residency

5.1.2 Attachment & Satisfaction towards the place:

65 percent respondents feel very attached to the neighborhood. The study did not identify any respondent who did not feel attached to the locality that they were living in. Similarly, 98 percent of respondents agree that they are satisfied with the current location of their building, and their neighborhood.

5.1.3 Plans of Migrating:

Majority (82 percent) of respondents did not plan to move from the location or migrate elsewhere. Figure 4 revealed that friendly neighborhood (54 percent) and having spent their lifetime (35 percent) in the locality were the major factor behind the denial to migrate.

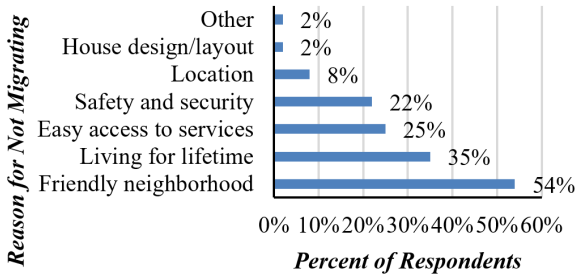

Figure 4: Reasons for Not Migrating

This justifies the desire of old age groups in core urban area of Lalitpur to continue living in the locality due to personal belongingness to the place.

5.2 Age-Friendly Housing and Building

Age-friendly housing and building are designed to enable older aged people to live independently despite compromised physical and mental health. Thus, caution should be paid towards the housing and building to ensure that old age people have easy access, easy mobility, and sufficient natural daylight and ventilation.

5.2.1 Access to Dwelling & Walkability:

Amongst the total respondents, 37 percent access their dwelling from courtyard, 34 percent from residential street, 17 percent from non-vehicle alley, and 12 percent from main road as shown in figure 5.

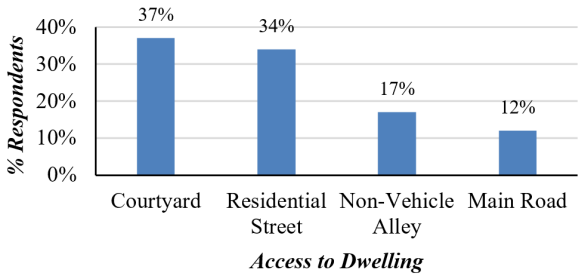

Figure 5: Access to Dwelling

36 percent respondents reported that they feel only a little comfort or safety while walking in the street, road, or alley in their locality. 3 percent reported that they do not feel safe and comfortable at all. The number of respondents who face difficulty in walking in the neighborhood reported vehicle movement, vehicle parking (figure 6), and congestion to be the major hindrance.

Figure 6: Vehicle Parking in Courtyard

If difficulty in walking persists due to problems in the surrounding, older citizens often find themselves dependent or in isolation at home which affects both their physical and mental health.

5.2.2 Connectivity to Essential Services:

Figure 7 depicts that 48 percent respondents in core urban area of Lalitpur can access essential services right beside their home. However, 47 percent reported that such services are situated 100 to 500 meters away from their home. This implies that they must walk for about 5 minutes to 15 minutes to access the services.

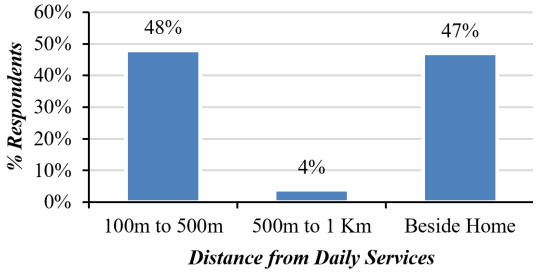

Figure 7: Connectivity to Essential Services

Likewise, 4 percent respondents revealed that such services are situated at 500 meters to 1 kilometer away from their home. The longer distance in acquiring basic services limits the independence of older individuals.

5.2.3 Number of Stories & Staircase Mobility:

Figure 8 suggests that majority respondents live in buildings with more than 3 stories. 63 percent respondents have three to four stories in their house and 32 percent respondents have more than 5 stories. Older aged individuals often face difficulty in conducting their daily activities if the number of stories in the building is high. This makes them dependent on others, as older individuals have limited physical capabilities.

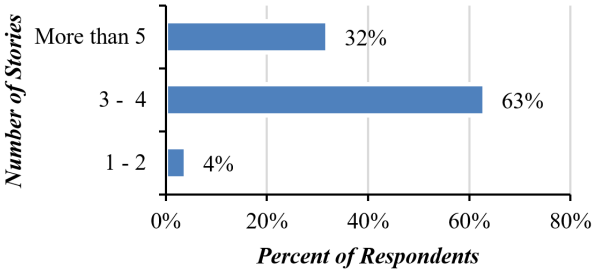

Figure 8: Number of Stories

Further, survey reveals that 43 percent of the respondents are not satisfied with the staircase in the building. A general notion behind the dissatisfaction is attributed to frequently climb up and down the staircase to conduct different activities.

The survey revealed that higher number of stories (figure 9, Right) and having to climb the staircase made them tired. They also responded that they did not have handrail in the staircase, which made their mobility much difficult.

Figure 9: Traditional (Left) & Modern (Right) Stories

5.2.4 Access to Bedroom & Toilet:

Figure 10 depicts that majority of respondents (53 percent) have bedroom on the third floor of their building. Likewise, 30 percent responded that their bedroom is situated on the second floor. 6 percent of respondents said that their bedroom is situated higher than third floor. Bedrooms at higher levels are not suitable for older individuals as it requires them to use staircase frequently.

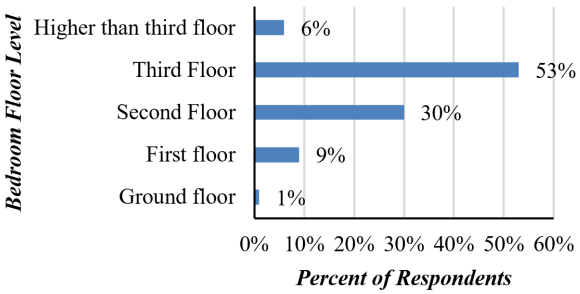

Figure 10: Access to Bedroom

Similarly, majority respondents said that they are satisfied with the location of toilet in the building. The survey revealed that respondent who are not satisfied with the location of toilet (15 percent) prefer bedroom & toilet on the same floor as it enhances both their mobility and access to utilities within the house.

5.2.5 Access to Natural Light and Ventilation:

Access to natural sunlight and ventilation is regarded as important for the health of old aged individuals. There should be minimum 2-hour direct sunlight in a room but 75 percent respondents do not have natural sunlight in their building due to blockage from the neighbor building and small opening sizes which can have an adverse impact on the health of older citizens. However, 75 percent respondents are satisfied with the natural ventilation in their building.

6. Discussion and Finding

One of the widely discussed phenomenon that is imperative for designing age-friendly cities is the notion of ageing in place [11], [12]. It establishes the need to design age-friendly built environment in respective localities of older adults as such individuals refrain from migrating to other cities or old-age homes due to personal belongingness and attachment to the areas or localities that they have been residing in.

The findings of this study revealed that actively ageing population prefer aging in place and did not want to move from the locality despite significant compromises their physical abilities to cope with the place. This sense of personal belongingness and attachment to the locality establishes a sense of notion of ageing in place [14].

This also confirms the need to build or modify the core urban area of Lalitpur, such that, it would be more old age-friendly to enable elderly citizen to not only live independently but also to maintain their mental and physical health imperative for quality of life and wellbeing. However, the findings shows that the core urban area of Lalitpur does not meet majority of criteria imperative of an age-friendly housing.

As recommended by World Health Organization and other age-friendly housing guidelines published by Livable Housing Australia, RIBA, among others, housing and buildings in age-friendly cities should be designed with much caution as it has significant bearing on the quality of life of old-aged groups. Such designs should not just ensure safety and comfort but also should be able to provide easy access to services both within and outside the house. It should be designed with utmost care regarding the deteriorating physical capacity of the active elders. Complex structures of housing and building can result in social isolation of the active elders due to restrictions in their mobility and access, which results in increased feeling of loneliness and depression.

The findings of this study suggest that the internal structure of the dwellings in LMC were less responsive to the requirements of age-friendly housing and buildings structure thus does not support independent and active ageing.

Traditionally, the classical and social set-up of the city was such that nuclear families were discouraged and people often lived in joint families. The previous physical and social structure of Lalitpur in some ways facilitated active aging given the fact that the elderly populations were looked after by their children and the neighborhood spaces consisted of ample buildings and structures for the elderly people to participate. It uniquely contributed to both the physical and mental well-being of the growing population.

In the past two decades, Lalitpur city has experienced substantial changes in demography, way of living, and built environment. With a decline in birth rate and rapid out-migration of youth, the old people often live alone in their houses. Given the previous societal structure, these people refrain from migrating to old-age homes or areas other than their native land. Additionally, the 25 April 2015 earthquake not only claimed hundreds of lives in the Valley but also partly or fully demolished many residential buildings displacing family members. This also led to abandoned old family homes by youths, forcing elderly people to stay behind alone in less secure buildings.

Traditional societal structure, dwelling access, living spaces (figure 11,12; Left), sunlight, ventilation, and circulation pattern had their own advantages regarding access to essential services, and physical and social wellbeing. However, penetration of the concept of a nuclear family in the area has resulted in vertical subdivision of the buildings, making people reluctant to build slender tall buildings in the limited land, as shown in figure 11 (right).

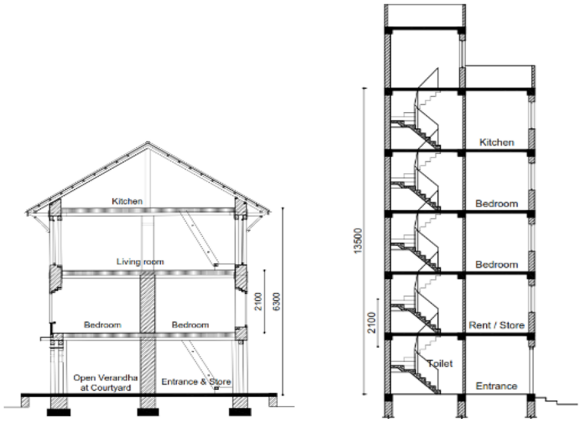

Figure 11: Typical Traditional (Left) & Modern (Right) Sections

The city has thus experienced numerous changes and a general observation suggests that the changes have an adverse impact on the older population as criteria for making the city age-friendly are often neglected or encroached upon while building new structures.

In the core urban area of Lalitpur, the responses regarding dwelling zones, dwelling type, and safety regarding building materials were positive. However, it was identified that more than 50 percent of houses were in row form of dwelling, more than 50 percent of the dwelling were situated at least 100 meters to 1 kilometer away from daily services and activities, and about 30 percent of individuals lived either in the non-vehicle alley or enclosed courtyard.

Table 1 shows that the non-vehicular access to the buildings obstructs movement during emergencies and

Table 1: Comparison between the Criteria for Age-Friendly Housing & Building and its Existing Status

S.N.	Factors	Literature	Existing	Inferences
1	*Access to dwelling and Walkability*	▪ Easy access to the dwelling	▪ Non-vehicular road access to dwelling restrict emergency access to the ambulance. ▪ Vehicular access dwelling leads to chaotic, noisy, pollution, and unsafe	▪ Restricting vehicular movement ▪ Concept of one way ▪ Vehicular movement Timing: Morning: 9 - 11am & Evening:5 to 7pm
		▪ Pedestrian friendly walkways with free of obstruction	▪ Difficult to walk due to high congestion ▪ Vehicular movement ▪ Obstruction from parked vehicles	▪ Pedestrian friendly walkways ▪ Planned vehicular movement ▪ Removal of chaotic vehicular parking
2	*Essential services like Daily groceries*	▪ Close proximity with easy access	▪ The essential services like groceries lies right beside the dwelling ▪ Within 5 to 15 min. walking distance	▪ Best reason to live in the core urban area
3	*Number of stories & Staircase mobility*	▪ More than two stories not recommended ▪ Staircase with handrails	▪ Dwelling more than 3 stories ▪ Congested staircase well with high riser ▪ Lack of proper handrails	▪ Elders circulation up to 2 stories ▪ Planned with easy access staircase ▪ Provide appropriate handrails ▪ Modification subsidiary from government
4	*Access to Bedroom and Toilet*	▪ Easy access ▪ On same floor	▪ Limited rooms per floor (only one room per floor) leads to difficult access ▪ Toilets & Bedroom are not in same floor	▪ Planned floor area design ▪ At least small toilet on bedroom floor
5	*Access to natural Light and Ventilation*	▪ Minimum 2 hour Sunlight in room ▪ Fresh Air	▪ No Sun light due to small window sizes ▪ Obstruct from adjoining tall buildings ▪ Satisfied ventilation	▪ Planned rooms design with sufficient sunlight ▪ Policy for tall building ▪ Designed natural cross ventilation

physical difficulties, however, it still provides privacy and security to the elders. Vehicular access to the building gives easy access during an emergency but is chaotic, noisy, polluted, and unsafe for the elders. Moreover, the study also identified that almost 40 percent of the elderly citizens found it difficult to walk in the neighborhood due to high congestion, parked vehicles, and vehicular movement. For elderly citizens with extensively compromised physical strength, accessing the dwelling can be a challenge, thus resulting in detachment with neighborhood or outdoor spaces and isolation. Likewise, having to travel a great distance to access services within the locality can result in higher dependence and restricts the mobility of elderly citizens [29]. Currently, it has been reported that elderly citizens need to travel at least 5 to 15 minutes to access essential services and activities, which is a best reason to live in core urban area.

Another major problem associated with dwellings in non-vehicular narrow alleys is that it acts as a barrier to access to natural light and ventilation. Given the rise in haphazard building structures throughout the city, it is difficult for dwelling in core areas of Lalitpur to access natural light and ventilation. This holds even in the case of the courtyard. The tall building in close proximity and lack of ample space in housing has translated to compromise on access to sunlight and ventilation in the buildings as the majority of houses can access sun only through their rooftop or in some front-facing windows.

The current building structures in LMC have only one room with small staircase area per story left after the subdivision as shown in figure 12 (right). 63 percent of respondents have three to four stories in their house and 32 percent respondents have more than 5 stories. The elder citizens thus need to frequently use the staircase for accessing rooms and services within the house. Physical constraints and lack of proper handrails in the staircase have further exacerbated the issue. Moreover, the risk of accidents in the staircase is higher amongst older adults [30]. Buildings with more than two-story are not recommended for old-aged individuals as such individuals are often

constrained by their physical strength to frequently move inside their house [31]. It diminishes their ability to access services within their house.

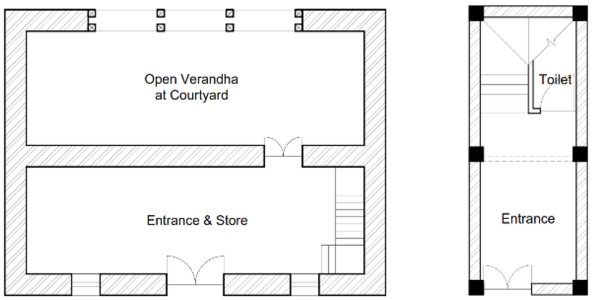

Figure 12: Typical Traditional (Left) & Modern (Right) Ground Floor Plan

Moreover, the elderly population refrain from going out of the house for social purposes because of the difficulty in having to climb up higher story buildings and rooms to return to their houses [32]. This not only affects the community participation of older citizens but also creates barriers to socializing within their house amongst family members.

The majority of respondents suggested that it would be easier for them if all the rooms were on the same floor, including the kitchen, bedroom, and toilet. However, such is not the case in Lalitpur. The elderly citizen often finds themselves dependent on others given constrained mobility within the house. Thus, such a structure adds a burden on both the mental and physical health of older citizens, diminishing their quality of life.

7. Conclusion

The findings of the study revealed that the elderly population in LMC have a strong notion of ageing in place. Majority individuals feel highly attached to their locality and do not intend to migrate. Thus, it is imperative for the city to have age-friendly built environment to facilitate active ageing of such elders.

Age-friendly housing and building is one of the imperative criteria of age-friendly built environment. Based on criteria introduced by different organization, it was identified that the housing and building structure in LMC are less response to active ageing. Some of the problems in LMC are difficulty in access and walkability, difficulty in mobility within the house and lack of access to sunlight. The results provide new insight into the changing housing structure's needs as per the changing social-cultural value.

This implies that the current housing structure prevents elderly individual to live actively and independently. Additionally, it also contributes to elders refraining from mobility both within and outside the house which leads to isolation, loneliness, and depression.

8. Recommendations

The findings of this study suggests that the architects and planners have a major role in ensuring that housing structures are age-friendly. Given the same, imperative aspects of age friendly housing like one floor layout; essential rooms bedroom and toilet on same floor, handrails in staircase, safe flooring plans, location of bedroom, access to sufficient sunlight and cross ventilation, access to building, and ease of mobility within the house should be considered by the architects.

Likewise, the government should develop a policy or housing guideline that promoted factors of age-friendly housing; residential zones, connectivity to essential services, planned vehicular movement & parking, pedestrian friendly walkways, policy for tall building, etc. Furthermore, subsidy for older population is recommended for the modification of the building.

9. Further Study

The study shows elders prefer 'ageing in place'. However, the research only covers housing and building structure thus the study is incomplete without the study of the neighborhood that envelopes the dwelling. Therefore, further study of the surrounding is highly recommended so that elders can age in place independently and actively.

The study conducted on elders living alone or with spouse only does not cover the elders who live with their adult children. In order to devise a policy, the needs of such group of older citizens should also be studied. Detailed investigation of this larger group of senior citizens can contribute to more comprehensive design of age-friendly housing & buildings.

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Date: September 15, 2022

To Whom It May Concern

This is to confirm that the paper titled "*The notion of Ageing in Place and Age-Friendly Housing in Core Urban Area of Lalitpur*" submitted by **ShreeJana Maharjan** with Conference ID **12046** has been accepted for presentation at the 12th IOE Graduate Conference being held in October 19 – 22, 2022 at Thapathali Campus, Kathmandu.

Khem Gyanwali, PhD
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