CHAPTER 1

INTRODUCTION

1.1 Background of Study

The First chapter of this research proposal presents sections consisting of the background of study, problem statement and the research gap. In addition, the research aim and objectives were stated. Three research questions in this ongoing study were posed based on three objectives. Hence, the hypotheses formulated will be to be tested. Thereafter, the scope, significance of study and anticipated findings were discussed.

An attempt is made to give a general background of this study, it is worthy of note to state that children is staged central consideration. However, West Africa have close to half of its population as children under 14 years (Robson, 1996, NPC, 2016). Similarly, children constitute 56% of Nigeria’s total population of over 180 million (NPC, 2016). This trickled to the military barracks’ demographic profile with high percentage population of children in Nigeria (Daodu, 2004). More also that the average child fertility rate in developed nations ranges from 1.5 to 2 children and 5.4 child rate per woman in Nigeria (NPC 2018). The military service in Nigeria give credence to dependent family of personnel especially the children (HTACOS, 2018). To this extent, Gewitz and his colloquies stated that when person is enlisted into the military, the entire immediate family joins in service. To this extent, the family plays crucial role in ensuring success of military operations (Gewitz et al., 2011., Park 2011). Similarly, a study in US military revealed that 51.4% of 3.5 million personnel married and 42% with dependent children (Deputy Assistance Secretary of Defence, 2015, NAF Directorate of Personnel Management, 2018), majority of military personnel in Nigeria are equally married. It indicates that military dependents far outnumbered service personnel. The issue of emotional, health and well-being of children is therefore a national and military authority’s priority (White House, 2011). Owing to this, middle age children from the ages of 5 to 12 years will be considered as unit of analysis of this study. This is the period that parents consider their children for liberty of independent mobility (IM). It includes licence to permit children’s walking and cycling freely in home to school and play areas in their neighbourhood environment without adult supervision. While many parents in the military barracks permit
their children above 12 years to attend secondary schools outside the barrack, middle childhood primary school are often restricted to school environment and play areas within the barracks. Thus, the population of elementary school children seem to outnumber secondary school children residing in the barracks community. More so that military boarding facilities are mainly for secondary schools. It is worthy to state here that Nigeria’s education system and admission policy of six years in elementary, three years in junior secondary, three in senior secondary and four years of higher learning in tertiary institution. This is structured in Nigeria’s education policy as contained in section 1 sub-section 5 of NPE (1997), (Odukoya, 2017). This starts from age of 5 or 6 for eligibility to primary school.

However, the upward population growth rate in Nigeria’s urban cities, urbanisation, and motorised mode of travel choice behaviour has affected children and the built environment. Academic discipline developed different lines of thought about the effect of built environment on children. These include field of studies in anthropology, human geography, environmental psychology, sociology studies of children’s population relating to settings (Atman and Wohlwill, 1978). Meanwhile, educational researches initially concentrated on learning opportunities of schools and after school setting. Later in the 21st century, it became an active area of study in children’s world as it urbanises. Opportunity for free play outdoor and independent mobility of children erodes in many nations of the world due to urbanisation. The media environment consumes more of children’s time. Hence, awareness became necessary that children need opportunity to contribute in creating sustainable environment that shapes them. Children’s built environment setting concentrates on a place-based scale concept expressing what they can visualise, hear, taste, smell, touch and navigate. Similar to finding in studies conducted in developed countries, the natural environment for children’s play has been observed to be near extinction in urban cities of Nigeria. These have equally affected the military barracks built environment and independent mobility of children, with adverse effect on their quality of life. On this note, independent mobility of children in military barracks built environment needed to be given attention. This is achievable through the review of available literatures. It also requires a good understanding of concepts that promotes child-friendly built environment.

Nonetheless, the background of many studies on child-environment study were rooted in the United Nations Convention of 1989 promoting Rights of Children in the society (Nordstrom, 2009). It emphasised the need for the welfare of children to be accorded priority
and opportunity to contribute and their views made relevant in decision making. In addition, the significance and need to create a conducive environment for children were advocated (Clark 2004). Moreover, child-friendly environment concept underpinned child-friendly cities and communities. The idea entails a understanding to improve health and well-being in cities for children (Chatterjee, 2005). Consequently, a United Nations Child-friendly City International Secretariat was founded by UNICEF in Florence (Roggio, 2002). The importance of parent-child relationship with their environment reflected in how free children feels in utilising their neighbourhood independently. However, for middle age children to explore, community such as barrack is a significant consideration in making it available. This explains the association between parent and children. It includes relationship that children create in the community where they live as key determinant of child-friendly environment.

Meanwhile, independent mobility accounts for freedom to move around and play outside their home environment. It is fundamentally important in a child friendly environment (Hart,1979; More,1986) and indicator of urban environment (Chawla,2002). The indicators include agreeable freedom within home territorial range, at a given time, specific destination, and licence from parents without being supervised by adult (Carver et al., 2010; Kyttä, 2004; Loebach and Gilliland, 2014; Villanueva et al., 2011). This is vital for children’s physical, social, mental, spiritual, and cognitive development (UNICEF, 1989). The Children independent mobility (CIM) changes to conform with variation in the built environment (BE) characteristics (Priemus et al., 2001). However, BE refers to the man-made features in a community or city. It is usually characterised by dimensions in past studies which depends on the context. The dimensions were analysed using a number of indicators. For example, density was measured by population density, residential density, and floor area ratio. Study on the association between BE and IM of children revealed significant increase in the degree of decline for some decades. This reduction was found to be responsible for children been obsessed, feeling of loneliness and fear. In addition, disadvantaged physical, social, and cognitive development occur in children. It also results in children’s incompetence, insufficient knowledge of environment (Rissotto and Tonucci, 2002), poor interaction and less opportunity for recreation (Prezza et al., 2001). Moreover, car dependency is also attributable to decline in IM of children (Lopes et al., 2014; Mackett, 2002). Studies revealed that features of BE are important to supporting travel mode choice behaviour and same time influence independent
mobility of children. Children’s distance and diverse features in outdoor play areas are also affected by varied BE attributes and social factors (Islam et al., 2016).

On the other hand, issues of reduction in access to neighbourhood outdoor spaces by children has been established (Gaster, 1991; Wright, 2004) especially in middle childhood (Chawla, 1992). This is also a concern for independent mobility of children in the military barracks built environment of Nigeria. It is important to know which outdoor places that barracks children like and which elements underlie these preferences. Noteworthy that opportunity for using equipment in playground and vegetation were often chosen by children as liked places. Studies have showed recently that formal play and sport settings were most preferred places during middle childhood and opportunity for liked play makes children’s preferences (Kopela et al., 2002, Loukaitou-Sideris, 2003; Min & Lee, 2006). This is in line with the concept of affordances as posited by Gibson (1979). In addition, the significant effect of outdoor vegetation in public housing like barracks cannot be downplayed (Coley, Kuo, & Sullivan, 1997). After safety, the places offering varieties of affordances of play opportunities are most likely to become children’s favourite. These include spaces supporting games with rules such as sports fields and other safe open spaces which seem to be meaningful to children. The findings in many studies revealed the impact of built environment on independent mobility in the context of the developed countries. The dearth of similar studies in Nigeria showed limited attention.

Regarding the military barracks in urban milieu, it is important to understand the military geographies, culture and its built environment in the context of developing countries including Nigeria. The military milieu refers to a surrounding culture, family, neighbourhood, school, people and everything that makes up the surroundings of military barracks. It also means the environmental condition and multicultural environment in which someone acts or lives and works. Moreover, it envelops economic disparity, class mobility, cultural values and gender roles. Oftentimes, the milieu shapes a person. Globally, Armed Forces barracks and police barracks are built in the low densely populated areas of towns and cities to protect national security interests. Military installations are particularly of sizeable expanse of land strategically located in outskirts to enable training exercises and usually far away from the general public. However, high traffic locations are avoided to allow for future expansion and upgrade to meet projected personnel population. Unfortunately, many of the barracks and
installations in Nigeria cities have merged with residential neighbourhoods and business districts due to urban expansion.

In Nigeria, the military barracks range from small outposts to military cities containing up to 100,000 people. Barracks size is usually determined by its establishment status, function and population of personnel to be quartered. Many barracks also harbour civilian staff and their dependants. The roles of the military in national defence, internal operations, peace keeping and humanitarian intervention necessitated the establishment of many military barracks in the developing countries including Nigeria. Typically, the operation area is often restricted, only authorized persons are permitted access irrespective of whether is a military personnel or not. Military barracks community usually provide a condominium housing estate with shared facilities for military personnel, offices and dining facilities. They also provide support facilities such as fast food restaurants, snack bar, gas station, religious centre (churches and mosque), schools, hospital or clinic, shopping and convenience retail stores, and beauty salon. Sporting facilities such as fitness centres, libraries, athletic fields, basketball hoops, child development centres automotive workshops, hobby/arts and crafts centres, bowling centres, and community activity centres. Based on this, an understanding of the military geographies, culture and its built environment in developing countries is necessary. It is essential to assess independent mobility towards advancing a child-friendly military barrack community. The geographical space of military barracks community can be harnessed by representations like maps, models, and how children can make decisions using such representations without compromising its security. It is important to note that military barracks community is a reflection of the society in terms of culture, social, political, economic and other policies that affect human existence. Noteworthy, is the social responsibility and civil-military relations advocacy that enable socio-economic facilities in barracks such as hospitals, religious centres, markets, and schools provide services for the public in developing countries including Nigeria.

Thus, the justification for military acquisition of large expanse of land for military assets and huge investment in the provision of housing and socio-economic facilities for personnel and dependents in barrack. The military also have a lot of influences on the political, social and technological advancement in developing countries to justify its maintenance. To this extent, the military establishes research and development at service and joint service levels to collaborate with civil research institutions and industries. A high percentage of civilian staff employed to beef up the strength of the military to perform its multi-function tasks reside in
the barracks. Most of the developing countries have become militarized as a result of internal security issues. Many barracks and check points are being proliferated in Nigeria. The military barracks geographies, culture and its built environment will be discussed more in literature review.

1.2 Problem Statement

The rate of growth in the Nigeria’s national population is high. This alongside the high rate of rural urban drift in search of social and economic activities has continued unabated (Kempe, 1986; Vernon, 2005; UN, 2007; Knox, 2009; Reinhard & Yasin, 2011). Meanwhile, the military barracks is always at the receiving end especially in the urban areas. The dwindling economic situation coupled with internal crisis in the country contributed to the military involvement in provision of special services for citizens in and out of barracks. Similarly, the military in fulfilling its humanitarian intervention role performs social responsibility to neighbouring settlements especially in crisis prone areas. It also ensures civil-military relations advocacy roles that informed constant collaboration with civil society in Nigeria. It thus, necessitated frequent access of civil populace to socio-economic facilities in barracks. Some of these facilities include internally displaced persons’ (IDP) camp, mammy market which is close distance area to soldiers in the barracks for relaxation with civilian friends after the day’s work, religious worship centres, health care centres, and sporting facilities. However, these have contributed in no little way to the high population density, overcrowding, and high volume of traffic experience in Nigeria barracks. The neighbouring settlements and host communities most often rely on already overstressed facilities and services in barracks to survive. Consequently, military barracks have turned into a constant area of transition zone, characterized by social disorganisation, heterogeneous way of life, self-fulfilling prophesy area, and crimogenic environment (Daodu, 2004). The negative environmental effect is more on children’s independent mobility and quality of life in barrack communities of Nigeria.

Moreover, many barracks communities in Nigeria cities have merged with residential neighbourhood and business districts due to urban expansion. The physical development plan for future expansion and upgrade of barracks to meet projected personnel population is no longer feasible. Additionally, previous planned open spaces in the barracks have been built up to minimise accommodation shortages (Omonobi, 2016 and Athekame, 2016). The ever increasing personnel population especially in Lagos barracks accommodating full complement
of armed forces personnel is worst for it. As a result of this, there is little or no space for middle childhood play areas and natural environment for play. Meanwhile, soldiers are paired due to shortage of accommodation in many of the barracks. This has resulted in high occupancy ratio, over stressing of infrastructural facilities and environmental problems that still persist in barracks across Nigeria urban cities (Omonobi, 2016 and Athekame, 2016).

On the other hand, the high rate of intake in the military without proportionate increase in housing facilities have affected the quality of everyday life of the children in the barracks (Daodu, 2004). The lack of physical planning development control and non-availability of barracks renewal policy to checkmate land use, densities and housing design affects environmental quality. Consequently, inadequate provision and maintenance of infrastructures such as road network and play areas for children that characterised military and police barracks in Nigeria has negatively impacted on child-friendliness of the barracks built environment (Adeniyi, 2004). Despite the proximity of residential housing to schools and other play areas for children, high level of mobility restrictions where they spend more time indoor still persists in barracks. Meanwhile, effective interventions to promote independent mobility of children in barracks as perceived by the populace is limited in study. The uniqueness of barracks built environment and travel mode choice behaviour in terms of land use mix, geographies, regimental culture that encourages condominium housing as a pilot study for larger society has not been explored by researchers. This is due to its sensitivity and misconception attached to barrack by the general public. Few available studies focused on adults in the barracks and retired personnel with little or no mention of children living in barracks.

Remarkably, lack of playgrounds with natural features including greenery hinders affordances of play for children in the barracks. Therefore, children are unable to harness the outdoor space for their physical, social, cognitive and emotional developments. The mobility of children in a child-friendly environment through landscape development facilities and meaningful children’s place had suffered setback. However, the neighbourhood environment has been found to contribute as physical venue and emotional experience to children (Brooks-Gunn et al., 1993; Hart and Risley, 1995; McCulloch, 2001; 2006; Sampson et al., 2002; Borton and Clark,2005; Carpiano et al., 2009; Leyland and Naess, 2009). Similarly, findings in past researches showed that children have good benefit in friendly physical environment (Bradly, (2006). Most importantly, the cognitive and behavioural functioning of children associated with their living physical environment (Duncan, Ziol-Guest and Kalil,2010; Evans
Several researches have been conducted on independent mobility of children towards a child-friendly environment, but inadequate studies have focused on the peculiar situation in the military barracks milieu. Rather, children that lives and grow-up in Nigeria barracks community are tagged ‘Barracks Boys’ and Girls’. This acronym is synonymous to stubborn and deviant children in the society particularly influenced by their environment. Considering the rapid and complex developmental stages of children (Bornstein & Lamb, 1992; Breinner & Fogel, 2001), the behaviour, psychology, cognition geographies of children’s development, and childhood needed to be thoroughly studied. Such study must give room to participation of children to speak up, right to play, and contribute to decision making in creating the environment that shapes them (UNESCO, 1989).

Regarding travel mode choice behaviour, the resultant effect of modernisation and technological advancement in the field of transport have made motorised mode of travel predominant in urban cities across Nigeria. This has trickled to the military barracks especially in urban areas. Public buses and tricycle popularly called keke were introduced as travel mode prevalent in barracks. Consequently, walking distance roads were equally covered by motorised transport in barracks. On the same note, many studies have linked built environment and active transport. It is necessary to be specific to travel mode choice behaviour that contributes to children development though independent mobility in barracks. The public health asset was also found to decrease the risk of adverse health effects (Lee et al., 2015). For children, the WHO recommends 60 min of moderate to vigorous physical activity daily to prevent diseases in with age (WHO, 2015; Faulkner et al., 2009; Janssen and Leblanc, 2010). On the contrary, motorised travel mode is still prevalent in the barracks community across Nigeria. Active travel to school and play areas by walking or cycling have been found to be valuable in children’s daily lives (Steinbach et al., 2012; Schoeppe et al., 2013; Dessing et al., 2014). It means that the environment shapes children and also determines travel mode choice behaviour. These have not been factored into barracks planning by the planners and policy makers to achieve child-friendly in cities and barracks in Nigeria.

Worthy of mention is the lack of defined cycle route, side walkways networks, and adequate landscape elements along routes in the barracks. The barracks landscape is bereaved of children places for play that enhance independent mobility and actualisation of affordances. Children’s road connections to school lack adequate greenery and beautiful landscape elements that attracts walking and cycling in home school journey. Moreover, the traffic congestion and
inadequate parking spaces are made worst by the travel mode choice behaviour. Studies have revealed that this behaviour is usually driven by personal characteristics, distance between home and school, safety due to traffic, and stranger-danger among others in cities including Nigeria barrack communities (Sirard and Slater, 2008; Schoeppe et al., 2013; Mitra, 2013). Active travel and modes choice to school and play areas needed to form bases for independent mobility of children in the military barracks. It can therefore reduce the adverse effects such as greenhouse gas emission and traffic congestion (Maibach et al., 2009). This research seeks to integrate children and parent experiences on active travel, outdoor barracks space utilisation for policy on independent mobility to improve well-being of children

1.3 Research Gap

Many recent researches on children and environment have employed various parameters to investigate and suggest solutions to address decline in children’s independent mobility in most developed countries (Gaster, 1992, Hillman and Adams, 1992………). Most of the studies were conducted through multidisciplinary approach in examining built environment characteristics, active travel, and travel mode choice behaviour of parents and children perspectives to promote child-friendly environment. Following the trends of studies on independent mobility since 1980, many studies have looked into how children can achieve control of their environment in term of object manipulation and environmental exploration. This emerged as important environmental policy (Wohlwill and Heft, 1987, Moore 1986 with access to diversity of resources. Studies in developed countries such as UK and western Europe also revealed that spatial mobility restrictions apply mostly to children as opposed to child labour in the developing countries (Punch, 2000, O’Brien et al.,2000 ……..). To this extent, mobility restriction was found to have affected home school journey and movement to play areas, mostly of younger girls. However, none of these studies to my knowledge have focused on children in the military barracks urban milieu. To achieve independent mobility of children, the whole city or barrack community public area must be seen as a play space where they can organise their own play freely, not just the small specific area or plot set aside for children use. They must be entitled to freedom from traffic, danger to their person from other people and undue influence of adult on their play activities (Hill and Bessant, 1999). Similarly, factors influencing independent mobility were analysed to arrive at mobility index in a past study. Four indicators of children independent mobility were established in previous study will be adopted.
However, the trend in the study of child-friendly environment using Horelli community based theoretical framework factorised ten normative dimensions into three (Horelli, 2007): (i) security and safety (physical and social sense which covers conditions threatening children’s safety and security through violence and danger), (ii) basic services (infrastructure that illustrates children’s social, economic and cultural situation including health, education, and transport), and (iii) urban environmental quality (physical elements of local environment).

Moreover, studies on built environment and travel mode choice behaviour have employed varied parameters to see their impact on children independent mobility in the developed countries like Europe. Despite that Nigeria is signatory to the UN treaties on children right to their environment, much of the impact has not been felt in according priorities to them. Similarly, no much significant consideration by planners and policy makers on barrack children in Nigeria. Although it is acknowledged that the process to do this varies in societal context, age, competency, and other factors. For instance, processes and procedure are being introduced at various tiers of government and school levels to provide increased opportunities for children in developed countries. Shared decision making is enhanced in that process as posited by Meltone (2000). This was properly linked with decision making pertaining to everyday lives of children. Notwithstanding, the micro level has been the focus of many studies regarding children independent mobility and play ranges. Therefore, in addressing the agenda of children policy, the planning policy must be addressed through research. Collaborative efforts of planners and policy makers and other stakeholders is also required. However, many barracks in Nigeria are often planned and constructed bereaved of benefits of condominium housing concept. This concept considers shared facility planning especially for children’s play areas that facilitates social interaction. Most barracks are not also environmentally friendly as physical developments are not properly coordinated to achieve the goal of child-friendly environment. Planners do not carry out sufficient research or analyse barracks built environment comprehensively. Similarly, they hardly involved stakeholders especially children at the conceptual stage. Most studies focused on adults in the barrack neighbourhoods that do not reflect the diversity and land mixed use patterns in which children of barrack community in developing countries live. Existing researches in developing countries have limited capacity to inform effective policies and interventions, especially to advance a research agenda that will fill existing gap in the literature. To avoid the pitfall of past studies on military barrack space a review of parameters and findings in literatures on related areas were reviewed.
1.4 Research Aim and Objectives

The aim of this study is to develop a policy framework of independent mobility that fits to child-friendly military barracks in Nigeria. The SEAB in Ikeja and NAF Base in Kaduna were selected as study sites of military barracks urban milieu in Nigeria. To achieve the aim, three research objectives were formulated as follows:

i. To identify indicators of children’s independent mobility in the military barracks of Nigeria

ii. To investigate the features of built environment and residential amenities that support or hinder independent mobility of children in the military barracks, and

iii. To examine travel mode choice behaviour of parent and children that influence independent mobility in the residential environment of the military barracks community of Nigeria.

1.5 Research Questions

The study sought to answer three research questions in accordance with the objectives as follows:

i. What are the indicators of children’s independent mobility in the military barracks?

ii. How can the built environment and residential amenities hinder or promote children independent mobility in the military barracks of Nigeria?

iii. What are the determinants of travel mode choice behavior that influence independent mobility of barracks children?

1.6 Research Hypotheses

The following hypothesis will be tested in the study based on objectives 1, 2 and 3.

1. H0: Children independent mobility indicators have no significant relationship(s) with built environment features and active travel mode choice behavior in the military barracks
H1: Children independent mobility indicators have significant relationship(s) with built environment features and active transport mode choice behavior in the military barracks

2. H0: Built environment features have no significant effect on travel mode choice behavior in the military barracks community.

H1: Built environment features have significant effect on travel mode choice behavior in the military barracks community.

1.7 Scope of the Study

The scope of this study covers the children’s independent mobility, the built environment features, active travel mode choice behaviour experiences in a child-friendly environment of the military barracks. Moreover, their everyday lives in relation to the three basic settings, home, school, and play area will be examined with the possibility of exploring the natural environmental features. To achieve these, the study will identify indicators of independent mobility and its effects on children and their environment. The research will take a cursory look at the significance of child-friendly built environment and physical planning development process of military barracks. Moreover, the travel mode choice behaviour of parent and children that influence parent licence to move around without adult’s accompaniment will be discussed. Consequently, the relationship between built environment and travel choice behaviour that supports independent mobility will be examined in the context of military barracks of Nigeria.

1.8 Significance of Study

This research will provide foundational knowledge on the subject of independent mobility of children as a measure to promote child-friendly environment of military barracks milieu in Nigeria. It will touch on the built environment, outdoor play and travel mode choice behavior perception of parents and children. Independent mobility of children in barracks been affected by rapid urbanization, high population density, built environment, and travel mode behavior in barracks communities of Nigeria will be studied. The works and services directorates saddled with the responsibility of physical planning development in the NAF required dynamic and adaptive research approach. Being dogmatic in spatial planning approach and renewal programs without due consideration for children in the military barrack
environment is not healthy for the future of the barracks. The present research would contribute to knowledge, practice and policy framework on children and environment of military barracks. The outcome will also be relevant and applicable to para-military barracks, housing estates, campuses and cities in Nigeria. On the other hand, the originality of the research is in the area of promoting the best travel mode choice behaviour of children and parent perception in barracks community. Thus, developing an independent mobility framework to harmonise the affordance of children play in the barracks built environment as a meaningful place will be necessary.

1.9 Anticipated Findings

The study on independent mobility of children in military barracks is expected to explore its uniqueness by integrating the military profession, its regimental culture, and geographies of built environmental features. The land use mix development requires a transportation planning that harness a potential travel mode that will be beneficial to children’s wellbeing. To achieve a for sustainable child-friendly military barracks community that promotes quality of life and wellbeing of children, this research anticipates findings that will integrate active travel mode choice behaviour (walking or cycling) as a matter of policy. The barracks neighbourhood due to close destinations (shops, markets, and school) shortens trip distances (Van Loon and Frank, 2011). It is expected to increase destination accessibility and promotes walking and cycling within the home geographical ranges in the barracks built environment. It will also be in line with the fact that neighbourhood having pronounced land-use diversity make trip connection by active travel more convenient (Saelens and Handy, 2008). It is hoped that the findings will help the planners and policy makers to come up with barracks built environment and travel mode choice that supports independent mobility of children in military barracks urban milieu of Nigeria.

The study on independent mobility of children in military barracks urban milieu of Nigeria is expected bridge a research gap as parameters were selected based on the context. The travel mode choice behaviour will be integrated to enable views from parents and children on independent mobility in barracks built environment.
1.10 Structure of Research Proposal Stage

The research proposal stage consists of three chapters which include the Introduction, literature review and methodology. However, the literature review is sub-divided into two parts. The first part dealt with the review of literature from books, thesis, and journal articles. It is designed to address the thesis question and explore how a child-friendly built environment and travel mode choice behaviour supports independent mobility of children. The second part will concentrate on the study areas. Subsequently, the research design will be done to cover the thesis.

Flow Chart for research proposal stage

Gant chart for the research project

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CHAPTER 2

REVIEW OF LITERATURES ON INDEPENDENT MOBILITY CONCEPT AND CHILD-FRIENDLY BUILT ENVIRONMENT

2.1 Introduction

Chapter 2 contains literature review on the concept of independent mobility and trends, child-friendly built environment covering child-friendly home, school and play area settings. Built environment characteristics, active travel and mode choice behaviour were also discussed. However, a broad range of literatures from relevant field of study including environmental psychology, human geography, landscape architecture, urban planning, public health, education sociology, and social psychology were consulted. As a way of identifying the gap, three articles were presented in conferences and submitted for publication in peer reviewed journals. These includes an appraisal of independent mobility towards advancing child-friendly military barracks in the developing countries, built environment characteristics and active travel mode choice behaviour impact on children independent mobility as well as children’s place versus place for children in the developing countries. These reviewed studies made use of books, theses, and journals with several articles through electronic databases from UTM e-library, Google Scholar, and Science Direct and Scopus. Comments were made based on personal observations concerning some issues during the review. The search range was from 1979-2018 publications. Though it was stated earlier that the study of children and nature dates back to 18th century as introduced by romantic literature, but all necessary documents were searched up to 1979. Search terms included, social sciences and humanity, environmental psychology, health and place, built environment, urban planning, transport geography, children’s independent mobility, child-friendly environment, and security. Personal observation reference lists of the selected publications were checked to identify more studies as well as personal profiles of several and notable authors to further relevant information. The methodology in this study conform to most of the past researches on children’s environment.
2.2 Concept of Independent mobility

The IM was conceptualised by Hillman and his colleagues in their early 1990s studies. It simply refers to children’s freedom of active movement and play outside the home environment within a territorial range, at a given time, destination, and licence from parents without adult accompaniment (Hillman et al., 1990; O’Brien et al., 2000). This is important for children’s physical, social and cognitive development. The IM contributes to acquisition of physical activity (Oliver et al., 2016; Schoeppe et al., 2014), it also allows children learn through independent interaction in their environment (Morrow, 2003). Thus, knowledge they acquire interacting with place contribute to self-identity, safety, and make them socially competent (Proshansky and Gottlieb, 1989).

In health researches, independent and mobility have been used variously describe childhood relationship (Mikkelsen and Christensen, 2009). Despite these health benefits of IM for children, this behaviour has continued to reduce all over developed countries in America and Europe in recent times (Fyhri et al., 2011; Shaw et al., 2015; Witten et al., 2013). Consequently, many other researches comparing older generation indicates that children were not likely to travel without supervision in their neighbourhood environments including destinations like parks, during play time (Karsten, 2005; Witten et al., 2013). This is similar to the recent occurrence, where improvement in salary of personnel overtime increased car availability of households and encouraged motorise travel dependency in barracks. Likewise, the quest to increase housing stock has led to converting open spaces for children play into shopping and event centre as noticed in SEAB Ikeja which has affected the destinations for children’s independent play in barracks.

Furthermore, Pooley et al., (2005) in their study categorised mobility into three levels. These include home school journey, shopping and visiting friends as the first level. The second level included everyday mobility as a social function of interaction in social network, friendship and local communities. Mobility was also considered as a cultural function to construct personal identity in the third level. These three levels are relevant in military barracks owing to the land use mix nature that combine all social activities and interaction of children (home, school, play areas and other socio-economic facilities) within the barracks. Recently, modernisation and advancement in technology has brought another dimension into monitoring independent children with the use of mobile phones (Mikkelsen and Christensen, 2009). It further reinforced the fact that independent mobility is a social construct that must reflect
modern societal changes. This resultant effect of advancement in technology has equally influenced independent mobility of children in the barrack milieu of Nigeria.

On the other hand, several reasons have been adduced for the reduction in CIM. To the extent that researches explore various views showed consistency in parental safety concerns as one of the factors responsible (Jago et al., 2009; Veitch et al., 2006). Parenting safety consciousness was found to be responsible for accompaniment and motorised travel mode choice that seem to override benefits of IM in many countries (Karsten, 2005; Fyhri et al., 2011; Mackett et al., 2007). The media reports of children’s kidnapping and abduction are some experiences in the barracks communities of Nigeria responsible for parent’s fear of safety.

This study intent to explore quantitative and qualitative approach in data collection and analysis of independent mobility indicators (territorial range, destination, time and parental licence) using parent and children perception. GIS and GPS will be used to obtain home geographical range and destination to be compared with the report of investigation that will be obtained from parent and children participation.

2.2.1 Trends of Independent Mobility of Children

Historically, the concept of independent mobility was first operationalised by Hillman et al. (1990), they studied CIM in England and Germany in 1971 and 1990. The countries have similarity in residential density, range of urban and rural environment and car ownership. The study was revisited based on same geographical area in 2010 which is about 39 years after (Shaw et al., 2013). Hillman’s work was replicated by O’Brien et al., (2000) with six parameters on parent licenses. The study involved childhood in urban space and project localisation in English primary school (10-11 years old) and secondary school (13-14 years olds) in the late 1990s. The study revealed a decrease in CIM despite limitations in the three studies that parent report of licenses on home school journey excluded other destinations for IM measurements.

On the current global trend of CIM, researches covering more than four decades have showed decline (Hillman et al., 1990, Shaw et al., 2013, Shaw et al., 2015, Prezza et al., 2001). Present researches emphasised age as important factor of CIM which reflect what is already know from previous studies. The biggest study to date used CIM data from 16 countries including Australia, Brazil, Denmark, England, Finland, France, Germany, Ireland, Israel, Italy, Japan, Norway, Portugal, South Africa, Sri Lanka and Sweden (Shaw et al., 2015).
2.2.2 Determinants of Independent Mobility

Several factors of built environment and travel modes have been identified in past studies that influence independent mobility of children. However, this study will focus on indicators earlier mentioned as dependent variable. The factorisation of child-friendly built environment travel mode choice behaviour as independent variables as determinant of independent mobility of children in the military barrack of Nigeria.

2.3 Review of Child-friendly Built Environment

The advancement of environmental child-friendliness is a community based, it is beyond an individual level (Horelli, 1998). It was aimed at integrating children experiences to issues of planning by making them participate in planning decisions. The physical environment connects children’s place concept and immediate environment. Similar to military barracks cities, strategies were aimed at providing a range of physical activity and social settings in past studies (Chitterjee, 2005). The environment setting geographically spread covered the immediate environment to neighbourhood and citywide location of children (Chitterjee, 2005). It’s also in consonance with Horelli’s theory on child-friendly structures as a network of places with meaningful activities for children to experience a sense of belonging lonely or in group (Horelli, 1998). Consequently, this research will combine both children’s experiential and behavioural place-based knowledge with objective measurable, place characteristics of barracks specific setting. This can be employed in barracks to arrive at place based knowledge of where children can feel, taste hear and navigate their neighbourhood.

In addition, a child interaction with the physical environment needs to satisfy four basic criteria which include movement, comfort, competence and control. The essence of intellectual development is children’s ability to locate himself freely in space by assuming different postures, create his own boundary and access to diverse territories (Piaget, 1963). Moreover, the need to feel comfortable and secure in their environment is necessary as settings are perceived to be comfortable by providing varied degree of stimulation for senses. Therefore, a beneficial environment allows children to achieve fulfilment in their personal needs, execute task successfully, able to control their own play materials and movement from one place to the other. Likewise, a child needs control over his personal environment for privacy, predictions, and proper orientation (Wolfe and Laufer, 1974). All of which a child-friendly barrack
environment must seek to achieve independent mobility of children and well-being without jeopardising the essence of security.

2.3.1 Child-Friendly Home Setting

One of the settings where children spend a decent year of their lives is a home setting. This environment needs to be made free for them to exercise sense of freedom, control, participation in decisions concerning the shaping and linkage with outdoor and the neighbourhood. It is expected be meaningful or favourable place to them (Chawla, 2015 and Kytta, 2002). It could also provide avenue for social interactions. Home variables were used to determine which requires attention from mother in learning at home. The home setting consists of the internal and outdoor environments that influence children’s social interaction. Home internal environment is a place that provides children with sense of safety and security, children responds to shape, size and other qualities of indoor space. Children also territorially assert their independence in any form of identified secret place found in homes. Hence, plays are created by children even at home. Secret place may be a hiding place like cupboard in a house, inside roof or balconies. Children’s further engagement in a favourite place swings it to a secret place. Meanwhile, no supplement for children making secret place themselves, for such places bolster their development in terms of social, physical and cognitive development. Although, some research works have investigated eating behaviour at home as well as physical activities indoor. But responses to such spaces or place is yet to be studied in term of shape and quality to see if children’s involvement in creating internal places at home will make significant difference in children place. This would also have to do with materials, acoustics, and furnishing and proportion of children’s areas at home. Thus, this experiences in home indoor setting that promotes independent play for children without adult supervision is required to be studied in the context of military barracks.

On the other hand, child-friendly outdoor home setting involves yard as a place for child-friendly environment. It reveals how children living in a more established urban neighbourhood, normally loaded with closed blocks of flats such as barracks built environment responds to the yard as a place for play. In any case, investigations of the regular day to day existence of children reveal numerous cases of children relating to places in their neighbourhoods indistinguishable with places for children. Study revealed how chalk illustration on walkways, goal posts between two bushes, an opening in a wire fence that offers
alternative way to a lawn are incorporated. This demonstrates that children and their bodies implicitly call attention that they require better places than those adults make for them. This circumstance and examination of it drives one to support children ending up effectively engaged in planning and design at whatever point yards and other key places for children are redesigned or modernized. Accordingly, children have vital knowledge, and their contribution and participation is prominently conceivable (Chawla, 2002; Driskell, 2002; Hart, 2002). Certainly, as observers of children’s play have noted, children incorporate planning, development in casual play. Thus, children’s places are regularly less obvious than places for children and adults see them from an alternative point of view than children do. Considering them to be cases of disorder, chaos, destruction and prohibited behaviour. Although middle age children in barracks take solace in watching older children and adults play especially in football field and parade ground which are dominant playground in the barracks or create unstructured play for themselves. The barracks open space which has been observed to be dominated by adults needed to be considered for re-planning to cater for children’s development.

2.3.2 The idea of Child-friendly School in a setting

The idea of a child-friendly learning environment supported by the UNICEF is to make every child physically secure, safe emotionally and psychologically stable. The school is a personal and social environment that is significant in the lives of children. Nonetheless, it is a place that enables children take responsibility for their learning, healthy lifestyles and promotion of life skills. Teachers play important role in creating an effective and inclusive learning internal environment. A supportive educational and community environment that is inclusive, healthy, friendly, and protective and rights based is also essential. Child-friendly schools are aimed at developing a learning environment in which children are motivated and able to learn.

The idea of such child-friendly school environment is essential in the military barracks. Above all, a rights-based, child-friendly school must reflect barracks an environment of good quality learning environment characterized by several essential aspects in collaboration with stakeholders. At the National level, ministries, development agencies, civil society organizations and other stakeholders, the framework for child-friendly school environment can be used to achieve policies goals and programs leading to child-friendly systems and
environment. It is therefore necessary to integrate stakeholders at the military barracks community level to include school staff, policy makers, and parents.

2.3.3 Contemporary Playground as Place for Children

Many contemporary playgrounds have resemblance and separated sets of tool in a single form of grass which have no association with place (Herrington & Studtmann, 1998). However, restricted motivation and activities have affected many playground for middle age children (Cohen, McGinty, & Moore, 1978; Frost, 1992a; Lynch, 1961), this is similar to the situation in barracks. Many playgrounds are developmentally deficient (Frost & Klein, 1983; Frost, Wortham, & Reifel, 2001). Some are uninteresting (Beckwith, 1998, 2000; Moore, 1989), they appeal to children only when such play areas are fresh (Langendorfer et al., 2008). However, most of such play areas, with platforms, steps and slides that are placed on secure rubber surfaces are bereaved of play scape and often fail to act as social places. It also cannot meet the simple prospect desired of a playground. This suggested that the idea of the contemporary play area in McDonald’s structured playground, described by Eric Schlosser as one of the best development is moribund (Solomon, 2005). The case of barracks is made worst as contemporary playground and places for children are either not provided, maintained or not properly equipped with tools for play.

2.4 A brie Appraisal of Built Environment Characteristics

The built environment encompasses man-made features in a city or community. It is often characterised by identified dimension depending on the context. Some literature categorised the dimensions into 3Ds, 5Ds and 6Ds according to significance of parameter’s influence on children in the context. For instance, it was categorized into 5Ds in a study by Cervero and Kockelman, (1997); Ewing and Cervero, (2001). Consequently, built environment characteristics influences IM of children as revealed in the study.

However, many researches have been conducted of recent on the link between built environment and CIM due to increasing evidence of decline over the last few decades. This abysmal level of drop was found to have led to obsessed cases. In addition, it was found that the number of children with obesity increased from 21% to 26% between 1995 and 2012 (ANPHA, Australian National Preventive Health Agency, 2014). Furthermore, most previous studies focused on adult walking behaviour reported that intersection density has a positive
influence and dead-ends have a negative influence on walking (Frank et al., 2005; Kamruzzaman et al., 2016; Saelens et al., 2003; Van Cauwenberg et al., 2011). The relevance of these built environment factors in barracks context with land use mix cannot be overemphasised in determining independent mobility of children. Therefore, this research will explore the children active travel mode behaviour of walking or cycling in barracks built environment of Nigeria towards improving their well-being.

2.5 Children Travel Mode Choice Behaviour

Travel mode choice behaviour aspect is important to support IM of children. Meanwhile, researches have revealed various factors influencing mode choice behaviour among children, especially the choice of active travel mode such as cycling and walking. The socio-ecological model is often applied in health related researches to explain the determinants of physical activity (Green et al., 1996; Stokols et al., 1996). From the ecological perspective, physical activity links to the social and physical environment. However, different levels of factors exert disproportional amount of influences on physical activity (Grzywacz and Fuqua, 2000). Depending on the context, the influencing factors could be categorized into individual-level influences, household-level influences, surrounding environment influences and policy influences. The existing researches believe that the outcome of modal choice among children reflects the complex interactions between children and their surrounding environment.

In an attempt to review the existing literature on the multi-level determinants of modal choice among children as apply to military barracks, a look at socio-ecological perspective is necessary. In this research, individual characteristics and household features are internal factors. This represents the barrack children’s and house socio-economic status. Meanwhile, the surrounding environment and policy environment are seen as external factors. The surrounding environment refers to the broad living and studying environment the child is exposed to. It includes the built environment, the perceptive environment to children and their parents’ mind. Community environment such as the number of peers living with the child and crime rate of the community. The school quality can be influential to form the perceptive environment. The local customs and the travel culture within the barracks can be conductive to the modal choice of children and these variables also belong to surrounding environment. Despite the closeness of schools to residential quarters, the use of motorised travel still persist which affected children’s ability to explore environmental knowledge and other health benefits
in the neighbourhood. Following the surrounding environment, policies are another type of factor influencing children’s travel mode. The policies usually include education, population, transportation and planning policies and legislation. These policies may constrain or promote school accessibility, affecting the modal choices of children. The military authority has formulated some policies regarding education which allows 60% of barracks children and 40% civilian in neighbourhood settlements to be admitted in primary and secondary school located in the barracks (NAF Education Policy, 1967). Similarly, there is policy to control population density which disallowed personnel children above 18 years to officially reside in barracks (NAF Housing policy and Harmonise Terms and Condition of Service, 2018). This research will therefore seek to develop a policy framework of independent mobility that fits into child-friendly barracks built environment.

2.6 Reviewed articles presented in conference and submitted for publication

The Under listed articles have been presented in conferences awaiting publication in relevant journals and proceedings. Abstracts of the submitted article and the one presented in conference is at enclosure 1 and 2.

2.6.1 Independent mobility towards Advancing Child-friendly Military Barracks in Developing Countries

2.6.2 Built Environment Characteristics and Active Travel Mode Choice Behaviour Impact on Children Independent mobility

2.7 Theoretical and Conceptual Framework

The two theories underpinning this research are the Horelli theoretical framework and socio-ecological modal choice. They are combined to form a conceptual framework in analysing how child-friendly built environment and travel mode choice behaviour supports independent mobility of children in the military barracks community planning in Nigeria.

2.7.1 Horelli Child-friendly Theoretical Framework

In order to investigate child-friendly barracks built environment that promotes independent mobility, Horelli theoretical framework is considered as underpinning theory. The theory is relevant when considering children living in a geographically, cultural and socially different urban neighbourhood. Responses of children’s view of what they find to be child-friendly city or neighbourhood can be analysed according to the normative dimensions
developed by Horelli. Her ambition is to relate children experience to issues of planning by making them participant in the dynamics of planning. To this extent, ten normative dimensions significant in community planning were highlighted. Table 1 showed the 10 dimensions and suggested ways for linking children’s view to areas of planning. A study with youth of ages 13 to 18 years was first used to experiment the 10 dimensions by Haikkola and Horelli in 2002. Later in 2004, it was collaborated in another Finnish study by the same team but children of 12 years old. However, she factorised the 10 normative dimensions into 3 factors in the context of the study involving three groups. The groups are from different geographical and cultural background used to investigate what children’s find to be a child-friendly environment. The result indicates that three of the dimensions apply to their responses using three different neighbourhoods. Although the study employed qualitative approach using children verbal description as basis for categorising their responses on abstract definition according to dimensions. Then, children’s views are linked to issues of planning. These include security and safety, basic services, and urban environmental qualities. The parameters used like age of children vary in different context for planning purposes. In this study, two barracks community are involved, many of the parameters are the same except for population, built up area and vegetation that differs. the 10 dimensions were factorised into five most significant child-friendly built environment features applicable in the two barracks since children responses are likely to be same for planning purposes. These are; Security and safety (family, peers, and barracks community), basic services (provision and distribution of resources), urban environmental quality (ecology and land use mix). Additionally, sense of belonging, participation, and continuity of children may vary depending on the leadership of the barracks while housing, dwelling, and density have some differences as obtained from the Landsat imagery analysis obtained in objective 1 of this study.
2.7.2 Socio-ecological Model of Modal Choice

The ecological model by Bronfenbrenner (1979) was based on postulation that context is a significant factor in children development. Children context in this regard included family and friends, childcare and schools, as well as local neighbourhood (Leventhan and Brooks-Gunn, 2000). It consolidated on child development theory that sees home as the most proximate environmental influence on child development (Siddiqi et al., 2007.) Likewise, socio-ecological model was used for understanding associates and predators of children’s activity behaviours as the activity must be undertaken in a particular physical context (Sallis et al., 1998). Suggestion was made to improve the model using theory-driven behaviour and context measures (Giles-Corti et al., 2009) consequent upon which a call was made for more age-and sex-specific research using behaviour- and context specific measures for future environmental intervention (Giles-Cortis et al., 2009). In all, the basis for the socio-ecological model concentrated on environment and children’s activity behaviour.

However, this research will make use of the socio-ecological model by Green et al., (1996) and Stokols et al., (1996) to explain the determinants of travel mode behaviour of children in barracks. Meanwhile, travel mode choice behaviour has been widely studied in the past, but mainly in the Western context. The increasing use of motorised travel mode has been found to have negative effect on economy, health, social and environment. According to the mode, a child’s travel feature would be affected not only by their socioeconomic characteristics.
but other environmental factors. This include the household characteristics, socio-spatial environment and policy environment. Similarly, previous studies did not have thorough look at the socio-spatial environment and policy environment. In addition, the aspect of social structure is rated as one of the social process in which social exclusion is a vital indicator. From ecological view, physical activity directly related to the social and physical environment. Various level of factors different degree of influences on physical activity (Grzywacz and Fuqua, 2000). The factors were categorised into individual-level, household, surrounding environment, and policy influences (see fig 2.6). The existing studies reflected modal choice among children to be a complex interaction between children and their environment, individual and household features are categorised as internal factors while the surrounding environment and policy environment falls under external factors. The surrounding environment refers to the living and other learning environment of children. This include the built environment, the perceptive environment to children and their parents thought. In which case, the number of peers and crime rate of a community are considered. The quality of schools is also influential in perspective environment. Sequel to the surrounding environment, policies influence travel modes of children. It usually includes education, population, transportation and planning policies and legislation.

![Fig. 2.6. Socio-ecological model of modal choice behaviour among children.](image-url)
2.7.3 Conceptual Framework Development

Children independent mobility is a developmental process that requires graduated steps and knowledge of skill building in its planning approach to harness environmental and health benefits. Likewise, policy and planning issues contributes to achieving success of child-friendly environment. Horelli theoretical framework that gives room for children to express their view concerning planning issues in a neighbourhood will be adopted. The ten identified normative dimension from her work would be factorised into five most important dimensions. Five most significant child-friendly built environment features applicable in the two barracks were considered for the dimensions selected to contribute children’s view on planning issues in barracks. These are; Security and safety (family, peers, and barracks community), basic services (provision and distribution of resources), urban environmental quality (ecology and land use mix). Additionally, sense of belonging, participation, and continuity of children may vary depending on the leadership of the barracks while housing, dwelling, and density have some differences as obtained from the Landsat imagery analysis obtained in objective 1 of this study.

On the other hand, the socio-ecological model will form a base for the travel mode behaviour using five factors derived from socio-economic characteristics and social structure. It is obvious from literatures that the built environment characteristics and travel mode choice behaviour are inseparable in supporting independent mobility of children in barracks. It is therefore necessary to integrate these two as independent variables and test its significance and level of relationships with independent mobility as dependent variable. This study considers a conceptual development that put children in the heart as unit of analysis to anticipate support for independent mobility in military barracks through active mode choice behaviour. Hence, the framework seeks to integrate built environment factors and travel mode behaviour of walking and cycling. This is fundamentally important to both urban planners and policy makers in developing strategies and intervention that will systematically promote independent mobility and healthy urban living for children. Step 1 is to identify independent mobility indicators in objective 1, step 2 is to investigate child-friendly barracks built environment features factorised into five covering the three setting in the study area in objective 2, and step 3 tend to examine the travel mode choice behaviour in objective 3. It is important to know that the research cut across built environment, transportation and health study.
Fig 2.7. Conceptual Framework developed from Horelli theoretical framework and socio-ecological model

2.8 Summary

Summarily, research objective 2 is based on Horelli theoretical framework and research objective 3 based on socio-ecological model supports independent mobility of children. The built environment and travel behaviour are inseparable. Therefore, contextual factors in barracks may lead to more variation in modal choice among children.
3.1 Introduction

Chapter 3 explain the military geographies, culture and barracks built environment. It also looked into historical background and development of the study area. Subsequently, the study appraised barracks boys and girls as actors and mammy market in its built environment. Thereafter, the SEAB Ikeja Lagos and NAF base Kaduna were assessed in term of geographical location, population and urbanization.

3.2 Military Geographies, Culture and its Built Environment

The research on independent mobility in most developing countries is often confronted with challenges of lack of national data, policies, acts, improper planning regulation and implementation of built environment and transportation. Also inhibiting the study is scarcity of information and in-depth researches on children and environment as obtainable in developed countries. These have equally affected the military milieu, housing estates, campuses and other communities where children live. The military barracks milieu is chosen as a case study in developing countries for a pilot study, being a sizable community that has all supporting facilities. It is worthy of note that military barrack security checks or time restriction for non-resident to control influx like any other condominium housing estate does not make it completely restricted. However, military geographies can be expressed from the perspective of how military activities and institutions are constituted geographically. It covers a wide scope including analysis of military land use and the environmental impacts of military activities, explorations of representations and interpretation of military landscapes. It involves evaluating economic and social relations of military capabilities and the lifestyle of military personnel. The military environmental discourses draw its inspiration from related literatures. This involves the cultural geography of space and place. However, it is not limited to entities existing outside of social practice, rather most analysts are concerned with the way natural environment are constituted through copious social and cultural practices.

Moreover, the early history and comparative exploration of military culture covers the relationship between military culture and the larger society. The study of military culture is not
exhaustive and not restricted to the act of war. It involves the study of those beliefs, norms, values, rituals, and other outputs that make up and sustain military organizations. The uniqueness of the military reflects in preparation and conduct of ceremonies, military discipline, etiquette, staff work, and military technology that affects residents especially the children. The regimental and bullying culture has affected child-friendliness of barracks and perception of children independent mobility by parents in travel mode choices. Therefore, little or nothing has been mentioned on children and opportunity to harness independent mobility in child-friendly military barracks community in developing countries including Nigeria.

The history of barracks built environment cannot be complete without mentioning the provision of tents as temporary place of abode otherwise known as ‘Military Camp’. The need to enhance the welfare of its personnel gave rise to the having a permanent place called ‘Military Base’ or ‘Barracks’ The Federal Government of Nigeria and the Military authorities place high regard to the families of its personnel. The main reason for establishing barracks is to separate soldiers from the civilian population. It is in order to maintain discipline, training standard, and team spirit (esprit de corps). The military barracks have often been called "discipline factories for training soldiers". Some barracks are similar to industrial factories as they are considered not too pleasant buildings in outlook. In contrast, other barracks like Collins in Dublin, Paris, Berlin, Madrid, Vienna or London are known for their magnificent architecture. However, from the rough barracks of 19th-century, it has developed to internet-connected barracks. Consequently, permanent barracks were developed in the 18th century by France and Spain reflecting modern architecture. According to records, the English meaning of barracks, was derived from word barrack which is the Spanish word for a temporary shelter erected by soldiers. Moreover, history have it that early barracks were constructed to be multi-story blocks arranged in a group around open court yard. It was designed by architect Nicholas Hawksmoor. Looking at the 18th century, complex military life that led to separating housing based on ranks and file of officers with larger rooms was noticeable. The quarters for married officers were separated from single officers. Supporting amenities such as dining rooms and cook houses, bath houses, mess rooms, schools, hospitals, armouries, gymnasias, riding schools and stables were provided.

In contrast, developing countries are battling with contemporary security issues like ethno-religious, economic, and political crisis and internal security challenge such as militancy, insurgency, and kidnapping. These have necessitated the maintenance of large military
population and barracks in developing countries especially in Nigeria. In addition, the population of children in barracks, especially ages of 6-12 years in primary schools outnumbered adults. This explains and justifies establishment of more than one primary school in large barracks like SEAB Ikeja, Kaduna, NAF base Makurdi, and NAF base Kaduna in Nigeria. Notably, barracks built environment set up for military and paramilitary housing purposes consist of the operation, training or equipment storage area which is often restricted. The other zones are semi-public and public where children relate with their environment. Although this study is restricted to military barrack but the result and finding in the research is applicable to para-military barracks and other housing estates in the developing countries. The right of children to officially reside with parents is adequately provided in the Harmonized Terms and Condition of Service with maximum age of 18 years (HTACOS, 2018). Government and military authorities in Nigeria have made concerted efforts to ensure children participation in barracks activities with the provision of schools, and play areas. Barracks therefore remain Government and public interest in developing countries as posited by Okafor, BN (2016). He used the military and police barracks context as a case study to study public institution in Nigeria.

3.3 Background of the Study Area

A military base is generally referred to as barrack. It is a facility built to support military training and operations. Thus, it provides shelter for military equipment and personnel. Basically, a military barrack provides accommodations for one or more units. However, some complex barracks are built to sustain itself for long period. They are able to provide food, water and other life support necessities for residents while under siege. Barracks purposely built for military aviation are called military air bases and naval bases built for military ships alike. Barracks are usually extra-legal jurisdictions because they are not completely subject to civil law. Nevertheless, they can range from small outposts for military duties to complex military cities containing up to 100,000 people in a large expanse of land. The name adopted in any case depict the type of military activity that takes place at the barracks. In another way, barracks may refer solely to an establishment which is used by an army. It also applies to other sister forces such as marines, not including base used by either an Air Force or Navy. Barracks size is usually determined by its establishment status, function and population of personnel to be quartered. The roles of the military in national defence, internal operations, peace keeping and humanitarian intervention necessitated the establishment of many military barracks in the developing countries including Nigeria. Typically, the operation area is often restricted, only authorized persons are permitted access irrespective of whether is a military personnel or not.
Military barracks community usually provide a condominium housing estate with shared facilities for military personnel, offices and dining facilities. They also provide support facilities such as fast food restaurants, snack bar, gas station, religious centre (churches and mosque), schools, hospital or clinic, shopping and convenience retail stores, and beauty salon. Sporting facilities such as fitness centres, libraries, athletic fields, basketball hoops, child development centres automotive workshops, hobby or arts and crafts centres, bowling centres, and community activity centres.

Based on this, an understanding of the military geographies, culture and its built environment in developing countries is necessary. It is the bedrock for assessing independent mobility towards advancing a child-friendly military barrack community. The geographical space of military barracks community can be harnessed by representations like maps, models, and how children can make decisions using such representations without compromising the security. It is important to note that military barracks community is a reflection of the society in terms of culture, social, political, economic and other policies that affect human existence. Noteworthy, is the social responsibility and civil-military relations advocacy that enable socio-economic facilities in barracks such as hospitals, religious centres, markets, and schools provide services for the public in developing countries including Nigeria.

The Nigerian Military or Armed Forces comprised the NA, NN, and the NAF. The Armed Forces of Nigeria was established as a full complement to achieve the territorial defence of Nigeria on land, sea, and air. To play their roles in accordance with the Defence Policy as enshrined in the constitution of the Federal Republic of Nigeria, well-articulated objectives to achieving the aim of the policy was set to guide the services. It is worthy of note that the Nigerian military is a highly disciplined force that have successfully accomplish its task in national defence, peace keeping missions and internal securities. To this effect, military bases were established with policies on accommodation while in service and post service housing schemes. Policy concerning personnel dependants was also put in place through a well formulated Terms and Condition of Service (TACOS).

The choice of SAEB Lagos and NAF Base Kaduna in Nigeria is informed by the attraction of majority of NAF personnel to secure accommodation in either of the barracks. However, the two barracks are the most populated NAF Barracks in urban cities. NAF Base Lagos accommodates about 40% while NAF Base Kaduna accommodates about 30% of personnel in the NAF. SEAB provides services for the headquarters of the Logistics Command.
(LC) in Lagos and other co-located units and NAF base Kaduna render housing services to the Headquarters Air Training Command (ATC) and all co-located units of the NAF.

The NAF base Kaduna was the pioneer air Force military base in Nigeria established with the assistance of German government in April 1967 for personnel training and accommodation for personnel while SEAB was established in 1978. Both bases have witnessed a lot of changes in terms of infrastructural developments in their spatial organization. The SEAB Lagos is constraint because developments around the neighborhood while the NAF Base Kaduna has a large expanse of land with beautiful natural terrain. There is high occupancy ratio in the residential areas occasioned by the schools, medical centre, religious centres and other social economic facilities that attract the influx of civilians from the neighborhood.

3.4 Barrack Children as unit of analysis in its built environment

Children living in the barracks are popularly called “Barracks boys and girls” in Nigeria. They make considerable use of streets for play, shopping, and leisure travel. Likewise, they usually assumed to have good knowledge of their neighbourhood including both safe and unsafe places to play, short routes, secret places for adventure and other areas for hanging out.
This includes places like mammy market in the barracks. Studies in cities have showed children’s independent mobility to explore neighbourhood to be linked with acquisition of life skills (Van Vliet, 1985; Moore, 1986). Consequently, children’s sensory, motoric, emotional and cognitive development takes place in the form of play. Yet children’s play in the barracks is subjected to the logic of the its housing structure where play takes place mainly in spaces such as streets, gaps between buildings, courtyards, parks and eroded surfaces (Lynch, 1977; Klein and Liesenhoff, 1982). Barracks children often caged are curious to know the physical world in order to feel comfortable with it like every other child in other communities (Hart, 1979, p. 338). This freedom is tempered by parental concerns and children’s own fears. Additionally, high volume of traffic and lack of proper road network plan restricts the use of cycle especially for boys who are most likely to own them (Hillman et al., 1990). Gender differences in independent mobility are partly attributable to parental concerns and a common expectation that girls will be available to assist around the house. Girls are restricted to certain play behaviour by adults which affect their environmental confidence (Hart, 1979; Parkinson, 1987). Studies of children’s play revealed that special places are an important aspect of their interaction with the environment (Hart, 1979; Klein and Liesenhoff, 1982). Such places are usually linked by road networks or pathways which help in the development of route knowledge and in confidence building. The importance of unescorted journeys in promoting children’s self-esteem, a strong sense of identity, creative use of one’s mind and the capacity to take responsibility for oneself was found by Kegerreis (1993) and Noschis (1992b). Yet the marginalization of children in the city and communities like barracks has been observed. Thus, a US study showed that children living in the lowest density neighbourhood of Oakland in a physically isolated area from the rest of the city suffered than the three other neighbourhoods studied, despite their affluent middle class backgrounds (Berg and Medrich, 1980). While Oakland was physically pleasant and served motorised mode of travel better, children were isolated from unplanned free range cherished by their peers in the other neighbourhoods. Children are obliged to find ways of “fitting in” adapting to the environment that they happen to live in which exactly a similar situation of barracks children in Nigeria.’ Furthermore, traffic as a single most important impediment to children’s range, play patterns and independence is a serious challenge (Moore and Young, 1978; Hillman et al., 1990). Factors such as poor housing amenities, parental control and parents’ socio-economic status affects independent mobility of children, well-being and quality of life. Finally, many American adults have a
‘militarized idea of everyday life as though attack and defence is as appropriate subjective construct of warfare’ (Lennard and Crowhurst Lennard, 1992).

3.5 History of Mammy Market and its Influence on Barracks Built Environment

Mammy market has grown in popularity in Nigerian military barracks not only among the soldiers but civilian counterpart from neighbourhood settlements far and near. The set up and operation of the market has a lot of impact on the barracks built environment and children. However, it is essential to mention the origin of mammy markets in army barracks for a better understanding of its nature and organisation. Many unpublished documents has been written on the origin of the name mammy markets in the military Barracks (Jerrywright, Ukwu, 2016). The origin of the market that started around the barracks in Nigeria came to be as a result of the industry of Mrs Anthony Ochefu. She specialised in local brew called "enyi". She was quartered with her husband at the Army Barracks in Abakpa, Enugu. In a bid to eschew idleness and also earn some money to support her young family established a business of selling soft drinks. She prepares gruel, which is popularly called 'Umu or enyi’ in Idoma, or kunu in Hausa. She became popular with selling of umu, a local brew made from guinea corn.

Consequent upon a fire incidence that gulfed her shed, she stopped the production and sale of "umu" in the barrack for weeks. After a while, the RSM directed that a section of the barrack be reserved for her to produce and sell her "umu". She therefore built a small stall to continue her business. Eventually, most of her customers returned. Soon, other women in the barracks who became inspired by her industrious nature started selling other locally brewed items like burukutu, pito, palm wine, kain-kain and other alcoholic beverages. These are in addition to pepper soup and other delights for the relaxation of the low rank non-commissioned officers with their civilian friends in the evenings when they close from work. It was not long before that portion of the barracks became known as mammy market. However, it became a policy to establish mammy markets inside or near military barracks in the country. Similar markets attached to paramilitary barracks are also called mammy market. The market attracts a lot of people into barracks, thereby creating high traffic with negative consequences on built environment and children’s independent mobility.
3.6 Study Area 1 Sam Ethnan Air Force Base (SEAB) Ikeja Lagos

The SEAB, Ikeja is located along the popular Oshodi-Agege road, opposite public works department. It was formerly referred to as the Nigerian Air Force Base, Ikeja. The decision to re-name the barracks was in honour of the late base commander named Group Captain Sam Ethnan. He was believed to have sanitised the base to an outstanding extent during his tenure. The barracks share boundaries with Oshodi-Isolo Local Government Area (LGA) consisting of Mafoluku, Shogunle, local and international airport. The concept of condominium housing estate was adopted for the barracks design to provide shared facilities. The construction was done in phases with the first phase handled by Ms Julius Berger Construction Company in 1978. It was mainly prefabricated concrete structure which makes it stronger than the later construction by local contractors. The Base covers over 2,500 hectares of land. It provides not only residential accommodation for NAF personnel, but, important administrative offices. Ikeja LGA in Lagos state is one of the important mainland towns that formed the city of Lagos. The population of the metropolitan city was estimated at 14,842,000 million in 2018 from population of 325,000 in 1950 and projected at 16,168,000 million in 2020 at the growth rate of 4.19 annual changes (UN World Urbanisation Prospects). This makes Lagos one of the largest cities in Africa. The vibrant economy of the state is the singular reason why many young people are too eager to leave the rural areas for greener pasture. Sequel to the relocation of the Federal capital from Lagos to Abuja in 1991 and shortage of accommodation, many personnel who in Abuja still maintain family quarters in SEAB Ikeja, Lagos.
3.7 Study Area 2 Nigerian Air Force Base, Kaduna

The creation of Kaduna state in 1976 makes it one of the seven states in Northwestern geopolitical zones of Nigeria. It succeeds the old Northern region after splitting into six states with its capital at Kaduna. Kaduna state is made up of 23 LGAs, among which is Igabi Local Government with many colleges and universities. It also includes major military
institutions like Armed Forces Command and Staff College Jaji, Nigerian Defence Academy, College of Aviation and military training depots.

The NAF Base, Kaduna is located at Old Kaduna Airport, Kawo in Kaduna covering a total area of over 450,000 square metre area. The barrack is home to the Headquarters Training Command which has been separated to Air and Ground Training Commands recently. The Headquarters of Air Training Command remain in Kaduna. It also hosts collocated units and formations like Air Force Institute of Technology, Music school, communication group, aeromedical hospital air police training and other ground training centres. The barrack is surrounded by communities and villages such as Mando, Kawo, local airport and Rikachiku. It is the second largest Air Force barracks in Nigeria. The presence of training institutions attracts high influx of young people desirous to join the service and soldiers attending various basic and upgrading courses for promotion. The barrack accommodates two secondary school, one Air Force primary school 1, Government public primary sch, and 2 Nursery schools. The ratio of students in the schools is usually 60% personnel children and 40% civilian children as a matter of NAF educational policy. The rate of influx into the barrack has increased tremendously coupled with motorised travel mode. These have a far reaching effect on the built environment, independent mobility and travel mode choice behaviour in the barracks.
3.8 Summary

The two study areas are both in urban cities far apart. They have similarities in housing amenities and some built environment features. However, SEAB, Ikeja is densely populated, lack of natural features, no area for future expansion. In contrast, The NAF base, Kaduna is sparsely populated with large area, natural features with interesting topography.
CHAPTER 4
RESEARCH METHODOLOGY

4.1 Introduction

This research will apply Environment - Behavior research method to study children – place relationship in making better policy framework for barracks design and travel mode choice decision. It will also develop knowledge on the character of children – place relationship in military barracks towards improved quality of life. In other forms, the research methodology commonly called children and environment is concerned with the systematic study of the tripartite relationship between physical, social and cognitive functioning of children and their built environment dates back to the 1970s. It includes study of children’s spatial cognition and mapping abilities as well as use of and attachment to space. The growing interest may be traced in part to William Bunge (1970s; Bunge & Bordessa, 1975).

The research methodology covers the research design and procedure for proposal defense stage (see Fig.4.1). It also includes the data collection sources, method of data collection, and data analysis.

4.2 Research Methodology Design and Procedure

Methods and strategy to achieve objectives of the research will be highlighted and discussed in this section.

Flow chart

Table 4.1-Summary of Methodology

<table>
<thead>
<tr>
<th>S/No</th>
<th>Research Methods</th>
<th>Research Objectives</th>
<th>Variables</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>RO1</td>
<td>Data collection</td>
<td>To identify indicators of children’s independent mobility in the military barracks of Nigeria</td>
<td>Children independent mobility</td>
<td>- CIM Home territorial range</td>
</tr>
<tr>
<td></td>
<td>Data Analysis</td>
<td></td>
<td></td>
<td>- CIM Destinations</td>
</tr>
<tr>
<td></td>
<td>1. Landsat imagery classification of built up area, vegetation and open spaces</td>
<td></td>
<td></td>
<td>- CIM Time</td>
</tr>
<tr>
<td></td>
<td>2. GPS and GIS for boundary mapping, road connectivity, home territorial range, destination</td>
<td></td>
<td></td>
<td>- CIM Parental licence</td>
</tr>
<tr>
<td>RO2</td>
<td>Questionnaire</td>
<td>To investigate the features of built environment and Security and Safety</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Sample size (384 upper limit, Krejcie and Morgan, 1970)

- Descriptive statistics method (Frequency tables, Percentages, and pie charts)
- SPSS (Logistics regression, Multiple regression, Correlation, and ANOVA)
- Basic Services
- Urban Environmental Quality
- Land density and Housing
- Sense of belonging and Participation

Residential amenities that support or hinder children's independent mobility in the military barracks of Nigeria?

- Basic Services
- Urban Environmental Quality
- Land density and Housing
- Sense of belonging and Participation

RO3
- Questionnaire
- Interview
- Focus Group
- Observation
- Children participation
- Photography

Mixed mode approach

SPSS

To examine travel mode choice behaviour of parent and children that influence independent mobility in the residential environment of the military barracks community of Nigeria.

- Socio-economic factors (Age/Gender Household income)
- Strangers fear
- Fear of injury/bullying
- Car ownership and traffic safety
- Distance to school and play areas

Source: fieldwork (2018)

4.3 Data Collection Sources and Methods of data collection

Primary and secondary data collection sources will be employed in this research. The data collection techniques will be follow common methods for both quantitative and qualitative research.

4.3.1 Primary Data Collection Sources

Primary data collection will be done by conducting field surveys, use of GPS to take coordinates for destinations, and direct observation. The study area boundaries will be mapped out with ArcGIS. This will be in line with previous studies that found mapping to be useful for collecting data on home geographical range, destinations of middle childhood. Children will be involved in measuring the time to compare with the geographical range obtained from GIS. This suggest that children are capable of completing activities involving home school journey and visits to their local neighborhood play areas (Risstto and Tonucci, 2002; Veitch et al., 2008). Based on this, data on independent mobility indicators in objective 1 will be collected through mapping. The use of Landsat remote sensing for built up area, open spaces vegetation to determine land use changes for a period of 15 years for interval of 5 years. The GIS & GPS
will be employed for mapping the study area to get the destinations, road connectivity, home geographical range to schools and children’s play areas. Moreover, the mapping portion will include question on active travel behaviour to school and local destinations. Children home address to be obtained from their parents and geo coded using GIS. One map for each school location, street network and destinations. Children will use coloured marker to location to their home, route they usually walk or cycle to and from school and destinations they actively travel to. This will include space or parks, shops, friends and relations houses as well as other relevant places. In addition, children will write the names of their visited destinations and produce a demonstration map.

Having considered relevant literatures, the research will employ mosaic approach for data collection (James & Prout, 1997), Mc Neish,1999, Clark, & Moss,2001,2005 Stephenson, 2009) for objective 2 and 3. This will include experiment, survey, case study, questionnaire, interview, focus group, direct participation of children, observation, photography, and evaluation.

4.3.2 Secondary Data Collection Sources
Secondary data will be collected from census results, government departments, directorate of personnel management, provost squadron at SEAB, books, published and unpublished thesis and airman magazine produced yearly by the Headquarters Nigerian Air Force.

4.4 Methods of Data Collection
The methods of data collection include the use of Landsat imagery to obtain classification of built up area, vegetation, and open spaces. The GIS and GPS will be employed for mapping of boundaries, road connectivity, home geographical range and destinations (residential, schools and play areas) of built environment features in the barracks. Moreover, Questionnaire, interview, focus group, photography and personal observation will be used for data collection.

4.4.1 Landsat imagery, GIS and GPS
Objective measures of neighbourhood attributes. Landsat imagery will be used for classification. Geographic Information System (GIS), ArcMap 10 (ESRI) for children’s homes will be mapped and availability of parks, walking tracks, and bike tracks within an ranges from 100-1000 m pedestrian network (including bike paths and shared walking/cycling paths)
around each child's home will be computed. Network time for walk will be compiled (Mavoa et al., 2012). Distance between home and school along the most direct route via the pedestrian network will be measured.

4.4.2 Questionnaire

For the purpose of opinion survey, the study area will be classified into residential quarters (officers and airmen quarters), primary schools and play areas. The number of questionnaire to be administered in each sample size will differ following a sampling procedure. This is because the size of the quarters (officer & airmen quarters) and number of primary school varies in the 2 study area. Transit quarters for officers and airmen will be excluded especially those occupied by unmarried personnel. The format of questionnaire to be administered in various areas would be shown in tables as follows

Moreover, survey assistants will be employed and properly briefed. Two set of questionnaire will be used to elicit information from parents and children between ages of 5-12 years living and schooling in the barracks. The questionnaire will be sub-divided into 4 sections: section A will deal with demography data of respondents. Section B will investigate the built environment and housing amenities that promotes or hinders independent mobility of children. Section C will explore active travel mode choice behaviors of parents and children in the study areas. Lastly, section D will seek alternative policies and programmes that could engender improved quality of life and child-friendly military barracks.

In order to ensure the successful questionnaire administration, four (4) survey assistants would be employed in addition to efforts by the researcher to personally serve the respondents. The survey assistants would be drawn from personnel and teachers from the school and briefed on the mode of response to the questions. A total of 480 questionnaires will be administered in case of refusal to accept the questionnaire by some respondents, the number returned would be factorized to have a minimum of 384 upper limit (Krejcie and Morgan, 1970). Personal interview would be conducted to get information from policy makers (AOC, LC Base Commander, accommodation Officer in BSG, and provost squadron). Photographs will be taken by the researcher and children to show their favorite or meaningful place, (children place and place for children) in terms of play areas and other socio-economic facilities in the neighborhoods.
4.4.2 Interview

Interview will be conducted for the policy makers in the barracks housing management, especially the base commander, accommodation office and provost squadron. School head teachers will be granted semi-structured interview as well as children.

4.4.3 Focus Group

Focus group will be selected to enable participants freely discuss issues of personal relevance that allows interaction between participants. This will extend the level of discussion beyond individual interviews (Willis et al., 2009). The discussion will be grounded on socio-ecological model comprising multiple interacting factors. The primary school teachers will be consulted on suitable venue for participation, and time commitment. The school will then be expected to send invitation to parents of children requesting their consent to participate in the focus group. It will be conducted during school hours between 30-40minutes duration This research will make use of two focus groups to include parents and children considering semi-structured format of focus group (Daly et al., 2007). All focus group will de audio recorded, transcribed and anonymised for analysis. A note-taker will also record relevant points for discussion and observations of participant interaction and expressions.

4.5 Data Analysis

The data analysis will be in two parts, first is the interpretation and analysis of Landsat imagery, GIS and GPS mapping. Mixed mode of quantitative and qualitative method will be used in the analysis of questionnaire, interview, focus group, observation and photography.

4.5.1 Landsat imagery, GIS and GPS for Mapping

Classification of remote sensing and Landsat will be done. Mapping would be done with GIS and GPS on the study area in relation to immediate neighborhood. This is mainly in objective 1 of this research. The result of the classification using Landsat remote sensing. GIS and GPS mapping of home geographical range, road connectivity and destinations will be analyzed for children independent mobility indicators in objective 1. Time taken to walk and cycle from residential quarters to school and other destinations will be compiled. Aside this
first hand data that will be collected through survey and secondary data from government department and other sources will be obtained. In line with built environment and travel behavior studies, quantitative approach for statistical relationships will be used for objective 2 and 3.

4.5.2 Mixed mode method

This involves a combination of quantitative and qualitative approach to data collection and analysis. It will be employed in objective 2 and 3 of this research. Questionnaire will be analyzed, parent license negotiated by children will also be obtained from interview to be conducted and focus group discussion. This will be done for attributes of the respondents not practically quantifiable. Simple statistical method will include descriptive statistical method like frequency table, percentage and pie chart, while research results would be further analyzed using logistic regression and multiple regressions to test if child-friendly built environment factors, active travel mode choice behavior have significant effect on independent mobility in the military barrack. The perception of parent as children would examined. Correlation and ANOVA analysis will be carried out to test association identification. Travel mode choice behavior will be analyzed through logistic regression and multiple regression test (Wang et al., 2011a).

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