TRANSPORT AND SUSTAINABLE LIVELIHOOD IN LAGOS-BADAGRY PERI-URBAN AREAS, NIGERIA

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ABSTRACT

This study explores the influence of transport on sustainable livelihood in selected peri-urban areas of Lagos-Badagry corridor, southwest Nigeria to establish transport improvement priorities for sustainable livelihood. Data was collected from 129 systematically selected respondents in 3 out of 12 peri-urban settlements. Inferential statistics and sustainable livelihood framework (SLF) were used for data analyses. Findings revealed that majority (51.9%) of residents do not own vehicles and rely on public transport for livelihoods related trips. The relative significance analysis revealed that transport system had significant and positive impact on the sustainable livelihood of respondents (mean index = 3.47) and the highest impact being opportunity to invest in economic opportunities (relative significant index = 3.84). The study concludes that access to good public transport enhances peri-urban residents' ability to secure sustainable livelihoods. It therefore, recommends the rehabilitation of the major roads and effective traffic management along the peri-urban transport corridors for sustainable livelihoods development.

Keywords: Transport, Mobility, Travel, Livelihood, Sustainable livelihoods and Peri-urban Areas

INTRODUCTION

Transportation is described as the lifeblood of cities around the world, because, cities and metropolitan areas are hubs of sundry activities, requiring efficient and convenient transportation of persons and goods (Vuchic, 2002). Public modes of transportation have become necessary to urban centers and their hinterlands due to the high density of activities demanding high capacity transport modes that are economical, energy efficient and providing service delivery to all people. Therefore, transport systems and their services are fundamental necessities from which greater mobility for the entire population and other residents in the suburbs can be attained. Urban and peri-urban centers can be made prosperous, livable and attractive for people when the transport systems are well organized to make high-density of diverse activities, such as residences, business offices, factories, stadia, etc., physically possible and accessible.

Mobility and travel behavior are components of transportation studies for sustainable policy decision. Transportation decisions often involve tradeoffs between mobility and travel behavior in terms of access, people's ability to reach desired goods, services and activities. Mobility refers to the movement of people and goods that recognizes both automobile and transit modes on the assumption that movement is an end in itself rather than a means to an end with little consideration to nonmotorized modes or land use factors (Litman, 2003). Hence, for mobility to be sustainable, it should be seen as a means that also considers nonmotorized modes or land use factors too. On the other hand, travel behavior is the study of people's movement over a space and how they use transport for such movement in terms of frequency of trips, travel mode, purpose/destination, cost, time or speed. Therefore, mobility and travel behavior factors should be considered important in transportation decision making for a sustainable livelihood of the people.

Livelihood involves the capabilities, assets (stores, resources, claims and access) and activities required for a means of living (Chamber and Conway, 1992). The ability to recover from stress and shocks, maintain or enhance its capabilities and assets, and provide opportunities of a maintainable means of living for the next generation, makes livelihood sustainable (Majale, 2002). Sustainable livelihood contributes net benefits to other livelihoods at the local and global levels in the long and short term. The generally recognized assets of sustainable livelihood has been grouped into five broad categories, which are, the natural, human, social, financial and physical capital (McLeod, 2001). The process through which investments in, and policies on transport systems lead to improvements in the standard of living of the low and middle income groups often involves many links, with outcomes and associated benefits very often difficult to predict (Gannon and Liu, 1997). To ensure this improvement, there is need to emphasize on sustainable relationship between transport system investments and livelihood of people. Sustainability, according to Bromley (2008), is a dynamic process in which the exploitation of resources, direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs. Therefore, what makes the transport investment sustainable is when people can access and afford the transport facilities in the pursue of their livelihood now and in future.

While it may be difficult to predict or measure transport's impact on poverty reduction and improved standard of living, the relationship between the operations of public transport and the various indicators of sustainable livelihood need to be investigated. In their conclusions on this relationship, Gannon and Liu (1997) opine that lack of affordable access deprives lower income residents the access to job opportunities, very basic social services, and, improved employment and education

opportunities. Noteworthy is the fact that transport systems and services have played a vital role in shaping the standard of living of people in sub-Saharan Africa over the last century. However, precise implications for poverty alleviation and growth have varied considerably over time and place and between different sectors of the population (Porter, 2013). Clearly, efficient, regular, reliable and affordable transport services play an essential role in promoting growth and reducing poverty. In many parts of Africa, however, transport services remain entirely inadequate for user needs (Porter, 2013). Similarly, the relations between transportation and livelihood status in Nigeria are an apparent phenomenon which has obviously defined living standards and social classes. In the light of this, the need to weigh and evaluate the relationship between transport systems and sustainable livelihood is paramount in nation building for growth and development.

Arising from this background, this paper seeks to establish and examine the association between transport systems and the livelihood means of people as well as their socio-economic status with the central theme of sustainability in the metropolitan fringes (peri-urban areas) of Lagos state. This was carried out by evaluating the mobility pattern and access to public transport in the study area, assessing the impact of public transport on the status of livelihood of the residents, examining the relationship between the operations of public transport systems and the indicators of sustainable livelihood, and, identifying the socioeconomic characteristics of the residents of the selected peri-urban centres. This study is aimed at providing relevant information that could be useful for infrastructural development, improved citizens' welfare and overall national development.

THEORETICAL/EMPIRICAL RELATIONSHIPS OF MOBILITY, TRAVEL BEHAVIOUR AND LIVELIHOODS

Theoretical and empirical argument in this study is that for a sustainable livelihoods, the mobility for men, women, children and goods would be determined by the availability, affordability and efficiency of such transport systems. For instance, proximity to a road system without access to vehicles cannot serve the transport purpose. Similarly, vehicles cannot function well without a road in reasonable condition (Litman, 2010).

Mobility and accessibility are emphasized because they are concerned directly with behaviour and physical proximity. The two are highly influential on the decisions that will be made on transport system to ensure, enhance and sustain livelihoods. Definitely, the two terms are interwoven and work together in the examination of the relationships between transport systems and livelihoods for sustainable development. Transport system is the combination of both mobility and accessibility. These two components are also regarded as transport modes and transport infrastructure which form an operational transport system (Lourdes et al. 2006). In a larger view, transport infrastructures are; roads, bridges, bus-stop, train tracks and stations, waterways and airport. Contrarily, modes of transport are several means of moving passengers and goods around, such as: trucks, buses, mini-buses, cars, motorcycles, boats, railway and animal transport. These modes are either use for private or commercial purpose. Though commercial transport services involve users paying fares for transport service render to them (Litman, 2011), the extent to which it ensures sustainability of livelihoods of people, especially in Africa remains an issue to be investigated.

On the other hand, a livelihood is sustainable when, in the context of transport system, can manage stresses and shocks, and also care of the present and future needs, while not compromising the available natural resource base (DFID, 2003). The development of sustainable livelihood as a concept started with the ideal of poverty eradication, before developmental agencies and governments around the world began its usage for designing policies, projects and programs. According to Khanya (2008), sustainable livelihoods is regarded as an analytical tool which comprising a set of core principles entrenched within a largely theoretical framework. This tool has been extensively used by academics and development practitioners to improve

understanding of individual, household or community efforts to achieve daily livelihood and long-term betterment in a developing country view, especially Africa. One of such tools used and which is also the conceptual basis of this study is Sustainable Livelihoods Framework (SLF). According to Kazeem (2015) sustainable livelihood framework is used to determine the current and future impact of issues affecting people and development policies or strategies at the community level, such as people's assets, susceptibilities, hopes, opportunities as well as policies/institutions that affect people.

Arising from this background, past studies on the impacts of transport system (including mobility and its behavior) on the sustainable livelihood of people are reviewed. In measuring people's ability to sustainably reach goods, services and activities, Litman (2018) identified many factors affecting accessibility to include mobility (physical movement), the quality and affordability of transport options, transport system connectivity, mobility substitutes, and land use patterns. The study concludes that accessibility has tremendous direct and indirect impacts on the livelihoods of the people For instance, affordability or automobile operating costs and transit fares is discovered to have effect on the time, mode, and frequency of people's ability to reach their destinations for their livelihoods. Specifically, Mattson (2012) observed that people typically make 2-4daily trips outside their home, with higher levels of demand for people who commute to their jobs. Moreover, lower-income residents in automobile-dependent livelihoods locations tend to spend an excessive portion of their income on transport.

Transport modes have been observed to affect sustainable livelihoods locations or destinations. For example, Litman (2018) concluded that active modes (walking and cycling) are most appropriate for shorter trips, public transit is most appropriate for longer trips on major urban corridors, and automobiles are most appropriate for trips that involve heavier loads, longer trips and dispersed destinations. Further studies have shown that mobility substitutes such as improved access to internet services affect livelihoods locations. For instance, pharmacies may deliver medicines and other medical goods, rather than requiring customers to travel to a store (Telework," VTPI, 2006).

A study conducted by DFID (2003) to reveal similarities and differences in livelihood and mobility between income levels in Uganda and Zimbabwe showed that income-generating work was found to be the most frequent purpose of short-distance travel measured at 38% and 46% of all trip purposes respectively. In general, total daily short trip distance increases with wealth, whereby villagers spend the most time travelling while the secondary city dwellers spend the least. The survey also shows that fifty percent of all long distance journeys undertaken in Zimbabwe and Uganda comprised visiting relations, followed by funerals, weddings and rituals which accounted for another 20-25%. This means that the largest investment in long distance trip making was for social capital, with employment, business and trade as a travel purpose restricted to 12% and 17% in Uganda and Zimbabwe respectively; which indicates that on average Zimbabweans travel five times further than Ugandans. The study, therefore recommends that to promote mobility for sustainable livelihoods, access should be ensured through effective zoning/residential and transportation planning to negate the need for extraneous travel to services and employment opportunities.

Further studies on the effects of socio-economic status on the mobility and travel behavior of people have been conducted. Human mobility analysis is an interdisciplinary field that aims to understand the intrinsic properties of human movements as well as the mechanisms behind the observed pattern, that explains the set of locations that a particular person has visited as well as his/her travels among those locations (Schönfelder & Axhausen, 2003). This human mobility has been continuously be shaped by socio-economic factors. For example The differences in people's gender, race or ethnicity were found to be correlated

with their daily activities and movement patterns before the advent of Information and communication technology (ICT), (Hanson & Hanson, 1980, 1981; Kwan, 1999; Limtanakool, Dijst, & Schwanen, 2006). In fact Hanson & Hanson (1980) suggested that working men frequented recreation places and workplaces more often than did the women. Also Hanson and Hanson (1981) opted that an individual's travel frequency is positively correlated with employment status, and income has a positive impact on the spatial dispersion of destinations visited. They equally showed that education level, which also describes a person's socio-economic status, is negatively associated with travel range. This scenario in the relationship however changed with the introduction of ICT.

The change is witnessed in the study that showed that human movement patterns are strongly associated with socioeconomic indicators such as per capita income and poverty rate. Using Singapore and Boston as case studies, Yang Xu et al (2018) found that phone user groups that are generally richer tend to travel shorter in Singapore but longer in Boston. For other mobility indicators such as number of activity locations, activity entropy, and travel diversity, they found that for both cities, phone users across different socioeconomic classes exhibit very similar characteristics. This indicates that wealth level, at least in Singapore and Boston, is not a factor that restricts how people travel around in the city. They concluded that the relationship between mobility and socio-economic status could vary among cities because of the spatial arrangement of housing, employment opportunities, and human activities as well as level of ICT development.

So far, the review has shown that mobility affects livelihoods. Thus, this study examined how mobility could be promoted to ensure sustainable livelihoods development in African cities posting Lagos as a case study. This is achieved by examining the relationship between mobility, travel behavior and sustainable livelihoods.

THE STUDY AREA AND RESEARCH METHODOLOGY

The study area of this research consists of peri-urban settlements along the Lagos/Badagry axis of Lagos state. Lagos State is located in the south-western part of the Nigerian Federation. On the North and East it is bounded by Ogun State. In the West it shares boundaries with the Republic of Benin and in the southern borders lies the Atlantic Ocean (see Figure 1). Over the past five decades, Lagos state has witnessed speedy urban growth, at a rate that had been recognized as a 'special problem', a major challenge to urban and regional planning in Nigeria. The current population of Lagos state as at 2015 is 23,964,408 (Lagos Bureau of Statistics, 2016).

The population concentration in Lagos had been motivated by the agglomeration of the administrative, commercial and industrial activities in the Lagos metropolitan areas. This population concentration or urban growth has been attributed to densification of existing metropolis, spread of existing agglomeration and the emergency of the new agglomerations (e-Geopolis 2009). The last two initially started as peri-urban areas before they eventually become full urban agglomeration. This means, peri-urban land and land uses had been an integral part Lagos metropolitan development and hence the choice of the study area as shown in figure 2. This research was conducted using the quantitative techniques with a study population of 1275 houses in all the 12 identified peri-urban settlements along Lagos/Badagry corridor of Lagos state.

Adopting longitudinal survey approach, a sample size of 129 houses were chosen from the 3 purposively selected peri-urban settlements, namely Oko-Afo/Ilogbo-Eremi, Magbon and Mowo/Age-Mowo for sampling and questionnaire administration, using multi-stage sampling technique. In the first stage, each of the settlement was divided into four zones using major roads as boundary, except in the case of Mowo/Age-Mowo where natural boundary (forest) was used for the zoning. In each of the zone, the total numbers of streets were counted and 20% of the total number were systematically selected at interval every 5th street in the second stage. using estimated average number of houses per street as shown in column 4 in the table 1, total number of houses in the 3 selected settlements were estimated in the third stage.

Finally, every 10th house in each zone was systematically selected for questionnaire administration on purposively selected household heads or their representatives. Data collected from these representatives were on their socioeconomic and sustainable livelihood status as well as their mobility pattern and access to public transport. Reconnaissance surveys were also conducted to confirm the primary data collected data collected were analysized using descriptive techniques such as frequency distribution, mean and relative significance analysis.

Table 1: Sampling procedure and size

Communities	Total Number of Streets	Sampled Streets (20%)	Average Houses per street	Total Number of Houses	Sampled Houses (10%)	Sample Size
Magbon	90	18	32	576	58	58
Mowo/Age-Mowo	143	28	13	309	31	31
Oko-Afo/Ilogbo Eremi	131	26	15	390	40	40
Total	**364**	**72**		**1275**	**129**	**129**

Source: Authors field survey, 2018

Figure 1: Location of Lagos state in Nigeria Context

Figure 2: Location of Study Area along Lagos-Badagry Corridor

DATA ANALYSIS AND FINDINGS

Livelihoods Location and Mobility Pattern/Access to Public Transport System

The analysis of the respondents' livelihood location indicated that most of them sourced their daily living out of the community while the remaining 27.1% have their major livelihood located within the community as shown in Table 2. This result is in line with submission of Carlan et al, (2014) that, despite poor transport system that connects rurban areas to the city centers, rurban residents travel most, as majority of them travel daily to urban centers for socio-economic activities, regardless of available mode of transportation. Most of these residents have their major means of livelihood located in different part of Lagos metropolitan areas. Information from respondents shows that, residents of Magbon, Oko-afo/Ilogbo-Eremi, Mowo (the study settlements) and other rurban settlements along Lagos/Badagry express way of Lagos travel to different part of Lagos urban centers for their daily socio-economic activities, to places such as; Island, Oshodi, Alaba international, trade fair international market, Mile 2, Isolo, Iyana-Iba, Okokomaiko, Festac etc.

The analysis also revealed that 70% of the respondents make one trip (returned journey) per daily. This is the trip to their major means of livelihood in the morning and return back to their home in the evening while 11.6% of respondents make no daily trip because their means of livelihoods are located in their houses of residence as confirmed by personal interview. Only 17% make two trips per day and remaining 0.8% make more than two trips per day. Furthermore, 13.2% of the respondents make two trips (returned journey) per day and these are traders who patronize early morning and evening market. While 12.4% make at least three trips and these are transporters who make more than two trips (returned journey) every day.

However, it can be deduced from this analysis that, most people living in the rurban area of Lagos make average of one trip (returned journey) daily. The trip direction is from house of residence (rurban community) to major livelihood destination (mostly urban area). The implication of this is that, traffic is expected to be high along the corridor in the morning (when they are resuming to work) and evening (when they are returning home). Therefore, if the available transport system is not efficient, the performance of the peoples' livelihood strategies considering the daily travel demand will be hindered. Hence, the sustainability of such livelihood strategies is under threat.

Table 2: Livelihood location and number of daily trips of Respondents

Mobility pattern variables	Variables	Frequency (N=129)	Percentage (%)
Location of major means of Livelihood	Outside community	90	69.8
	Within community	35	27.1
	Others	4	3.1
	Total	**129**	**100**
Daily trips to your major means of livelihood	None	15	11.6
	one	89	70.0
	Two	17	13.2
	Three	6	12.4
	Four	1	0.8
	Five	1	0.8
	Total	**129**	**100**

Source: authors field survey (2018)

Accessibility and Quality of Public Transport

Assessing the accessibility condition of public transport revealed that, public transport is accessible in the study area as shown in Table 3. Confirming this, 47.3% of the respondents ranked accessibility condition of the public transport in the area as good (4), 24.8% ranked as very good (5) , 23.3% ranked as fair (3), 3.9% ranked as bad (2) while 0.8% ranked accessibility of public transport as very bad (1) in the area. Based on this fact, this study concluded that, rurban residents in Lagos have access to public transport to connect their major means of livelihood in different part of Lagos urban areas on regular basis. On the quality of public transport used for daily trip to major means of livelihood, 65.9% of the respondents ranked quality of public transport in the area as fair condition (3), 21.0% ranked as good (4), 10.8% ranked as bad (2) and 2.3% ranked as very good (5). This analysis revealed that quality of public transport in the rurban area of Lagos was rated relatively average.

Sustainable Livelihood Status and Impact of Transport System

An examination of the sustainable livelihood status of people in the study area is presented in the Table 4. Respondents were asked to provide an assessment of their sustainable livelihood level using sustainable livelihood indicators derived from the sustainable livelihood framework (SLF). The indicators are derived from variables that comprise five human capitals of sustainable livelihood framework. The sustainable livelihood ratings were conducted on a scale of 1 – 10, where 10 represented the maximum level and 1 the minimum level. For analysis, these indicators were further regrouped in to three categories, which are; 1 – 3 (low), 4 – 6 (average) and 7 – 10 (high) level.

Table 3: Accessibility and Quality of the Public Transport

Access to Public Transport variables	Ranking	Frequency (N=129)	Percentage (%)
Access to public transport	1 (very bad)	1	0.8
	2 (bad)	5	3.9
	3 (fair)	30	23.3
	4 (good)	61	47.3
	5 (very good)	32	24.8
	Total	**129**	**100**
Quality of public transport	1 (very bad)	0	0.00
	2 (bad)	13	10.8
	3 (fair)	85	65.9
	4 (good)	27	21.0
	5 (very good)	3	2.4
	Total	**129**	**100**

Sourc:Authors'fieldsurvey,2018)

Table 4 revealed that the respondents have average ability to generate income (71.3%), to secure employment (69.0%), to secure better education or training (67.4%), to participate in community development (67.4%), to invest in economic opportunities/saving (77.5%), to secure better health care (73.6%) and ability for social network and community relation (61.5%). Also, the analysis shows that 19.0% to less than 24.0% of the respondents have high ability ranking to secure those sustainable livelihood indicators while between 6.0% to less than 16.0% have low ability ranking to secure those livelihoods. Based on this analysis, it could be concluded that residents of the settlements are living within the range of average sustainable

livelihood. Most of them could not afford private vehicle, thereby relying on public transport to maintain and sustain their livelihood. This highlights the significance of transport system/network on the sustainable livelihood of rurban residents and hence the need to determine such significance or impact.

Table 4: Sustainable Livelihood status of the respondents

Sustainable Livelihood indicators	Ability Ranking	Freq. (N=129)	Percent. (%)
Ability to generate income	1-3	8	6.2
	4-6	92	71.3
	7-10	29	22.5
	Total	**129**	**100**
Ability to secure employment	1-3	13	10.1
	4-6	89	69.0
	7-10	27	20.9
	Total	**129**	**100**
Ability to secure better education or training	1-3	8	.3
	4-6	87	67.4
	7-10	34	26.3
	Total	**129**	**100**
Ability to participate in community development	1-3	15	11.7
	4-6	87	67.4
	7-10	27	20.9
	Total	**129**	**100**
Ability to invest in economic opportunities/ Savings	1-3	15	11.6
	4-6	100	77.5
	7-10	14	10.9
	Total	**129**	**100**
Ability to secure better health care	1-3	9	7.0
	4-6	95	73.6
	7-10	25	19.4
	Total	**129**	**100.0**
Ability for social networking/ community relations	1-3	20	15.6
	4-6	79	61.2
	7-10	30	23.2
	Total	**129**	**100**

Source: author field survey (2018)

The significance weight or impact is determined using the formula shown and computed as presented in Table 5.

Significance Weight Value (SWV) = $1n_1 + 2n_2 + 3n_3 + \ldots + 7n_7$

$$SWV = \sum_{i=1}^{7} XiYi$$

Relative Significance Index (RSI) = $\dfrac{\text{Significance Weight Value (SWV)}}{\text{Total number of responses (N)}}$

Mean Index $(MI) = \dfrac{\Sigma RSI}{Na}$

Mean Deviation (MD)　　= MI – RSI

Where　N = Total number of responses, n = Ratings of respondents　　and Na = Count of identified household attributes

The effect of transport system on sustainable livelihood is ranked from 1 – 6.

1 = Don't' Know; 2 = No Impact; 3 = Highly Negative; 4 = Slightly Negative; 5 = slightly positive; 6 = Highly Positive

The Relative Significance Analysis (RSA) conducted was to identify the livelihood attributes of the rurban residents that were significantly impacted by the operations of public transports in the area. From the analysis, it was observed that the transport system has significant effects on the livelihoods in term of income generation, saving and investment, employment and participation in community development. These livelihood indicators were identified by using the mean index for this location as the threshold for separating the relative impact index. The mean index of transport impact on sustainable livelihood is 3.47.

Table 5: Relative Significance Analysis of Respondent Opinion on impact of the public transport system on livelihood strategies

Livelihood Attributes	6	5	4	3	2	1	Significance Weight Value (SWV)	Relative Sig. Index (RSI)	Mean Index	Mean Dev
Income generation	20	13	16	56	21	3	356	**3.56**		-0.09
Employment	20	15	29	38	24	3	358	**3.58**		-0.11
Better education or training	10	20	42	1	44	2	340	3.40		0.07
Participation in ComDevt.	11	16	49	20	32	1	361	**3.61**	3.47	-0.14
Investment in econ. opports / Savings	30	16	25	29	24	5	384	**3.84**		-0.37
Quality health care	4	21	44	22	35	3	337	3.37		0.1
Social Network	1	14	41	14	55	4	291	2.91		0.56
Total	**96**	**115**	**246**	**180**	**235**	**21**	**2427**	**24.27**		**0.02**

It was discovered that, public transport system has high impact on peoples' ability to generate income, secure employment, participation in community development and investment in economic opportunity/saving. Four of the livelihoods attributes which have RSI higher than the mean index include ability to invest in economic opportunities (3.84), participation in community development (3.61), employment (3.58) and (income generation). Meanwhile, the impact is low on peoples' ability to secure better education, better health care and community relation /social network. The livelihood attribute with the lowest RSI is social network (2.91). In summary, it could be inferred that, public transport system affected sustainable livelihood of rurban residents.

Correlates of Public Transport Operation and Sustainable Livelihood

The relationship between transport system and Sustainable Livelihoods in rurban settlements of Lagos was conducted using Spearman Rank correlation analysis. The sustainable livelihood Variables (indicators) which are; Income generation, Employment, Better education or training, Participation in community development, Investment in economic opportunities/ Savings, Quality health care, and Social network/Community relations were correlated with public transport variables including; accessibility, quality, reliability, safety, efficiency, comfortability, affordability, and customer relation of public transport operators of public transport system in rurban communities.

The correlation analysis as shown in table 6 presents that there is a significant relationship between transport system variables (parameters) and the sustainable livelihood variables (indicators). These relationships were either positive or negative. For instance, accessibility of public transport system across the three areas examined had significant positive relationship with Income generation at 0.05% level of significance. This implies that the higher the income generated by the residents, the higher the level of trip generation at 95% level of confidence. Likewise, Employment, participation in community development, Investment in economic opportunities/Savings and social network/Community had significant positive relationships with accessibility to public transport system. But, better education and community relation had no relationship with access to public transport system. Any value above level of significance (0.05) indicates significant relationship between the variables, and the higher the value, the more the level of significance.

Similarly, values below 0.05 indicate no relationship between variables. In any case of a relationship to show whether or not it is significant, the variables of transport system and sustainable livelihoods as earlier obtained, were subjected to logistic regression as shown in Table 7. The logistic regression shows that transport network is beneficially significant to sustainable livelihoods (χ^2 (1) = 25.441, p<0.01). Confirming this, the Wald test as presented in Table 8 shows that the independent variables (sustainable livelihoods) are statistically significant at(p=0.000<0.01). The implication of this result is that increasing trip generation through improved transport system in the rurban settlement will increase the likelihood of sustainable livelihoods activities of residents. This means that increase in trip generated will increase the sustainability of livelihood strategies in the rurban settlements.

Socio-Economic Status and Sustainable Livelihood Level

So far, the impact and correlates of public transport system with sustainable livelihoods have been examined. However, it is important to query if the observed impact/correlates could be explained by the socio-economic status of the people. This query informed the need to examine the socio-economic status of the people along with their livelihoods. The socio – economic status/attributes of the residents are presented in Table 9.

The analysis of the socio-economic attributes of the respondents revealed that, majority of the respondents are male with 65.95% against the female counterpart of 34.1%. From the survey, almost all the respondents are in strong working class category. More than 90% are between ages of 20 and 59 years, which is the strong working class category in the Nigeria context while less than 5% are less than 20 years and 60 years above. Therefore, approximately, all respondents fall within the productive age; hence they are capable of undertaking economic activities to make end needs, relying more on transport system.

In terms of education, majority have obtained formal education (98.4%) as compared to 1.65% who have no formal education. Out of people with formal education, 52.7% of the respondents have tertiary education, 41.1% have secondary education and just 4.7% had only primary education. The relevance of this information is because investments in education and skill acquisition will increase livelihood alternatives. Caldwell (1974) asserts that education offers individuals with great prospect and contributes to participation in formal employment. Thus educational level has an important influence on the sustainable livelihood human capital to present the possibility of undertaking livelihood strategies.

It was further observed that, most people in the study area engage in informal occupational sector. The analysis shows that 57.9% of the respondents are engaged in different forms of informal occupation, 25.6% are in formal employment while unemployed and student (higher institution) recorded 7.0% each, the remaining 3.1% of the respondents are retired. However, since most of the respondents (more than 80%) are employed, most of the rurban dweller will have the potential of using transport system to get to their various means of livelihood. Their means of livelihood indicated that 24.8% of the respondents engage in trading as their major means of livelihood, 24.0% are in public/private services, 6.2% in commercial transport services, 15.5% are casual workers (majorly factory work), 13.2% are artisans and the remaining 16.3% derive their livelihood from other sources. This signifies that the livelihood strategies of most respondents (more than 60%) fall within the informal sector and this is not uncommon within the urban fringes of Lagos and most African cities. The ILO (1990) noted that livelihoods in most African cities no longer centre principally on wage-earning jobs in the formal or government and parastatal sectors of the economy. However, all these livelihood strategies are subject to the socio-economic status of the people as shall later verify.

Also, the survey showed that about 19.4% of the respondents earn above ₦100,000 monthly, 24% earn between ₦75001 and ₦100,000, 18.6% earn between ₦50,001 and ₦75,000, another 24% of respondent earn between ₦25,001 and ₦50,000 a month. While12.4% of the respondents earn between ₦1 and ₦25,000 as their average monthly income and 1.6% earn no income, probably the dependent students. This analysis revealed that, most people in the study area earn above ₦18,000 minimum wage of federal government of Nigeria monthly. Finally, about 51.9% of the respondents do not own private vehicle, 38.0% have one vehicle, 8.5% has two vehicles and just 1.6% have more than two vehicles. This analysis point to the significance of public transport system in the area, since majority of the residents cannot afford their own private vehicle and those that have may not be willing to use due to traffic.

Table 6: Correlates Public Transport performance and sustainable Livelihood

		Access	Quality	Efficiency	Reliability	Comfortability	Affordability	Safety	Customer relations quality
Income generation	Correlation Coefficient	.112	.145	-.097	.084	-.050	.186	.194	-.154
Employment	Correlation Coefficient	.026	.082	.073	.041	.028	-.126	.058	-.087
Better education or training	Correlation Coefficient	-.299**	.020	-.005	-.311**	.012	-.099	-.195	.078
Participation in comm dev.	Correlation Coefficient	.138	.147	-.027	-.099	.019	.016	-.055	-.021
Investment in econ. opports / Savings	Correlation Coefficient	.361**	.038	.024	.086	-.295**	.264**	.070	-.229*
Quality health care	Correlation Coefficient	.118	.046	-.252*	-.005	-.213*	.098	.044	-.181
Social network	Correlation Coefficient	-.095	-.038	.038	-.026	-.226*	-.165	-.088	.026

Correlation significant at * $p<0.05$ ** $p<0.01$

Table 7: Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	25.441	1	.000
	Block	25.441	1	.000
	Model	25.441	1	.000

Table 8: Variables in the Equation of logistic analysis

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	**Sustainable Livelihoods**						
		.747	.175	18.138	1	.000	2.111
	Constant						
		-2.796	.868	10.372	1	.001	.061

a. Variable(s) entered on step 1: **Sustainable Livelihood**

Table 9: Socio- economic attributes of the residents

Socio-Economic variables		Frequency (N=129)	Percentage (%)
Gender	Male	85	65.9
	Female	44	34.1
	Total	**129**	**100**
Age Group	Less than 20	3	2.3
	20 – 29	28	21.7
	30 -39	48	37.2
	40 – 49	40	31.0
	50 - 59	7	5.4
	60 and Above	3	2.4
	Total	**129**	**100**
	Primary	6	4.7
	Secondary	53	41.1
	Tertiary	68	52.7
Educational Attainment	No formal Education	2	1.6
	Total	**129**	**100**
Employment/Occupation	Student	9	7.0
	Unemployed	9	7.0
	Retired	4	3.1
	Informal employment	74	57.4
	Formal employment	33	25.6
	Total	**129**	**100**
Major means of Livelihood	Trading	32	24.8
	Public/Private Sector service	31	24.0
	Transport	8	6.2
	Casual work	20	15.5
	Artisan	17	13.2
	Others	21	16.3
	Total	**129**	**100**
Average monthly income	None	2	1.6
	1-25,000	16	12.4
	25001-50000	31	24.0
	50,001-75,000	24	18.6
	75001-100,000	31	24.0
	Above 100,000	25	19.4
	Total	**129**	**100**
Number of Private Vehicles owned	None	67	51.9
	Two	11	8.5
	Three	2	1.6
	Total	**129**	**100**

Source: author field survey (2018)

To examine the relationship between socio-economic status and sustainable livelihoods, the variable of the socio-economic attributes is cross-tabbed with that of the livelihoods as presented in table 10. The table shows that people engaged in trading activities are mostly males (16.7%) whose average age is between 30 and 39 years (9.3%), with tertiary education obtained (13.2%), employed in informal sector (14.0%), earning between 25, 000 – 50,000 naira per month (6.3%) as well as between 75,000 – 100,000 naira per month (6.3%), but do not own vehicles (13.0%). The same scenario is observed for those in public/private services consisting of males (15.5%) between 30 – 39 years (9.3%), tertiary education obtained (12.4%), earning between 25,000 – 50,000 naira per month (6.3%) and between 75,000 – 100,000 naira per month (6.3%) and do not own vehicles (13.0%). The trends for people engaged in transport, casual work, artesian and other activities are similar but with different percentages as shown in Table 10.

In summary, the socio-economic status of the people engaged in various livelihoods shows that they are mainly males between the ages of 30 – 39 years mostly in informal activities despite attaining tertiary education and earning between 25, 000 – 100,000 naira per month but do not own vehicles. This implies that they rely heavily on public transport to commute to their means of livelihoods. However, based on their income per month, they could be able to afford the public transport if available and properly managed. In addition, this public transport would be mainly patronized by the productive aged males who are well educated and hence the need for efficient system of transportation for sustainability.

Table 10: Socio-economic status and Sustainable Livelihoods (n = 129)

Socio-economic variables	Trading		Public/private		Transport		Casual work		Artesian		Others		Total	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Sex: Male	21	16.5	20	15.5	6	4.6	13	10.0	11	8.5	14	10.8	85	65.9
Female	11	8.5	10	7.9	3	2.3	7	5.4	6	4.6	7	5.4	44	34.1
Total													**129**	**100.0**
Age Group: <20yrs	1	0.8	1	0.8	0	0.0	1	0.7	0	0.0	0	0.0	3	2.3
20 – 29	7	5.4	8	6.2	1	0.8	4	3.1	4	3.1	4	3.1	28	21.7
30 – 39	12	9.3	12	9.3	3	2.3	7	5.4	6	4.7	8	6.2	48	37.2
40 – 49	10	7.8	10	7.8	2	2.0	6	4.6	5	3.4	7	5.4	40	31.0
50 – 59	2	1.5	2	1.5	0	0.0	1	0.8	1	0.8	1	0.8	7	5.4
Above 60 yrs.	1	0.8	1	0.8	1	0.8	0	0.0	0	0.0	0	0.0	3	2.4
Total													**129**	**100.0**
Education obtained														
Primary	1	0.8	1	0.8	1	0.8	1	0.8	1	0.8	1	0.7	6	4.7
Secondary	13	10.1	13	10.1	3	2.3	8	6.2	7	5.4	9	7.1	53	41.1
Tertiary	17	13.2	16	12.4	4	3.0	11	8.5	9	7.1	11	8.5	68	52.7
No Education	1	0.8	1	0.8	0	0.0	0	0.0	0	0.0	0	0.0	2	1.6
Total													**129**	**100.0**
Employment														
Student	2	1.6	2	1.5	1	0.8	1	0.8	1	0.7	2	1.6	9	7.0
Unemployed	2	1.6	2	1.5	1	0.8	1	0.8	1	0.7	2	1.6	9	7.0
Retired	1	0.8	1	0.8	0	0.0	1	0.8	0	0.0	1	0.8	4	3.1
Informal	18	14.2	18	14.2	5	3.4	11	8.5	10	7.8	12	9.3	74	57.4
Formal	8	6.3	8	6.3	2	1.6	6	4.9	4	3.1	5	3.4	33	25.6
Total													**129**	**100.0**
Income per month														
None	1	0.8	1	0.8	0	0.0	0	0.0	0	0.0	0	0.0	2	1.6
1 – 25,000 Naira	4	3.1	4	3.1	1	0.7	2	1.6	2	1.6	3	2.3	16	12.4
25,001 – 50,000	8	6.3	8	6.3	2	1.6	4	3.2	4	3.2	5	3.4	31	24.0
50,001 – 75,000	6	4.6	6	4.6	2	1.6	4	3.2	3	2.3	3	2.3	24	18.6
75,001 – 100,000	8	6.3	8	6.3	2	1.6	4	3.2	4	3.2	5	3.4	31	24.0
Above 100,000.	6	4.6	6	4.6	2	1.6	4	3.2	3	2.3	4	3.1	25	19.4
Total													**129**	**100.0**
Vehicle ownership:														
None	17	13.0	17	13.0	4	3.2	10	7.8	9	7.0	10	7.8	67	51.9
Two	3	2.3	3	2.3	1	0.8	1	0.8	1	0.8	2	1.5	11	8.5
Three	1	0.8	1	0.8	0	0.0	0	0.0	0	0.0	0	0.0	2	1.6
Total													**129**	**100.0**

Source Authors field survey, 2018

CONCLUSION AND RECOMMENDATION

This paper examined transport in relation to livelihoods of the people in the selected peri-urban settlements of Lagos State in Nigeria with a view to determining how transport affect sustainability of livelihoods. The livelihoods locations of the people are outside their settlements, thus compelling them to undertake livelihood travel on daily basis regardless of available mode of transportation. The mobility pattern is that people mostly make one trip (return journey) per day to their major means of livelihoods in the morning and return back to their homes in the evening. Deduction is that such one trip could be as a result of none accessibility or availability of logistics and mode of transportation despite ranking public transport quality as good by the people.

Using the sustainable livelihood framework (SLF), the indicators of the sustainable livelihood identified include the ability to generate income, secure employment, secure better education, participate in community development, invest in economic opportunities, secure better health and ability for social networking. The relative significance analysis (RSA) result showed a high impact of public transport system (mobility & accessibility) on people's ability to generate income, secure employment, participate in community development and invest in economic development. Therefore to sustain these livelihoods the issues of mobility in terms of travel mode, time, frequency and cost must be addressed.

Corroborating this result, the correlation analysis showed that there is significant positive relationship between transport system variables (access, quality, efficiency, reliability, comfortability, affordability, safety) and the sustainable livelihood indicators. This means that, for accessibility or travel mode/time/frequency factor, an increase in trip generated will increase the sustainability of livelihood strategies of the people. Supporting this, logistic regression result shows that transport network is beneficially significant to sustainable livelihoods.

However, this beneficial impact of transport system on the sustainable livelihood has been traced to the socio-economic status of the people. The socio-economic status showed that the people engaged are mostly males within the active productive age of 30 – 39 years that obtained tertiary education and mainly employed in informal sector activities of trading and public/private services, earning between 25,000 – 100,000 naira per month but do not own vehicles. Coincidentally, this status is a reflection of the various livelihoods of the people and this means that they rely heavily on public transport since they don't own vehicles but earn enough to afford the transport. Therefore, for the livelihood to be sustainable, the public transport must be made accessible, efficient, reliable, affordable, safety and comfortable.

On this note, the study recommends that an innovative and improved transport system is required in these areas and other peri-urban areas of Lagos State. This could be complemented with rehabilitation of major roads and proper traffic management along rurban corridors which is in line with the recommendation of European League for Economic Co-operation that, an effective transportation system ensures a smooth socio-economic and physical development of a State and Nation in general.

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