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Integrated Rural Accessibility Planning: Feasible Option for Rural Access Planning in Nigeria

By

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Abstract

Rural roads are crucial to the socio-economic development of the rural inhabitants. It provides them the opportunity to access water and firewood points, farm plots and educational and health facilities among others. However, the state of rural roads in Nigeria is deplorable with about 75% of them in poor condition. The consequence is that the rural communities are cut off from socio-economic facilities resulting in perpetuation of rural poverty. Efforts geared towards rural access planning over the years in Nigeria relied on top-down approach and qualitative assessment of the travel characteristics of the rural people. The result is the dismal failure of the approach to provide sustainable solutions to the mobility constraints of members of rural communities. Therefore, the adoption of Integrated Rural Accessibility Planning, an approach that is quantifiable, need-based and participatory (bottom-up) in addressing the rural access problem of the rural people may be the option needed for solving the seemingly intractable rural accessibility constraints in the rural areas in the country.

1.0 Introduction

The ability or ease of reaching various destinations offering opportunities for desired activity is regarded as accessibility (Creightney, 1993). It is not only location-specific but involves time dimension also. Jones (1981) sees it as reaching a particular facility with minimum effort at shortest possible time. Accessibility in the rural areas involves the movements of people to certain socio-economic activities such as water source, locations of firewood, health (clinics) and educational (school) facilities as well as farms plots and grinding mill points among others. These movements usually take place within the vicinity of the settlements and are responsible for over 80% of the daily total trips of the rural inhabitants (Howe, 1997; Dixon-Fyle 1998; Calvo, 1998 and Fernando and Porter 2002). These trips are mostly undertaken through walking and head portage. Other important trips but which are less significant are made through the use of intermediate transport (e.g bicycle) and vehicular transport.

Over the years, the planning of access need of the rural people has witnessed series of methodological approach or paradigm shift. The initial access planning approach that extensively focused on infrastructure investment for conventional vehicles failed to achieve desired results. The need to broaden discussion on the travel demand characteristics of users led to the adoption of low cost –cost vehicles approach. The dissatisfaction with the outcome of this approach led to a search for a broader view of user travel demand characteristics that emerged in various studies in the 70s. The findings of these studies cast serious doubts on the benefits the rural people were likely to derive from the conventional road and motor vehicle based approach; but the approach did not provide alternative method for quantifying rural travel that might be used for effective policy formulation. A conceptual leap in rural transport planning was achieved with the adoption of household as the fundamental unit of travel analysis. The result was the quantification of household movements in terms of trips, time spent traveling and the distance traveled to various

facilities. The methodology of this approach was refined by further studies and formed the basis for the new access intervention planning approach – the Integrated Rural Accessibility Planning (IRAP).

The rural access planning in Nigeria over the years has followed this top-down approach with emphasis on comprehensive road construction for motor vehicles. This led to enormous rural road construction in the middle of the 20th century and thereafter. For instance, the length of rural road in the country increased from 40,225km in 1946 to 130,600km in 2000 (Nigeria, 1946 and Adeniji, 2001). Throughout this period, efforts towards rural access planning were neither based on the need of the people nor reflect their wishes and aspirations. The result was the complete failure of the improvement in rural access to have any positive effects on the lives of the rural inhabitants. It is therefore imperative to seek for an approach that takes into consideration the access need and views of the rural people.

Integrated Rural Accessibility Planning therefore is a need-based, local level planning tool that seeks to address access needs of the rural people in a cost effective manner. The planning tool identifies the access needs of the households and the most appropriate interventions to reduce transport problems. It focuses not only on the improvement of infrastructure and services but also on the location and quality of service. The adoption of this planning approach in Nigeria will provide appropriate transport solution to the seemingly intractable rural accessibility problems in the country.

2.0 Methodological/Paradigm shift in Rural Transport Planning in Developing Countries.

The initial approach to rural transport planning focused exclusively on road infrastructure investment for conventional vehicles which was to act as a catalyst for economic and social change as well as serving as the prime means for enhancing accessibility and personal mobility (Hirshman, 1958; Wilson 1965). This approach relied exclusively on investment in road infrastructure that was expected to lead to rural transformation. Early criticism of the approach focused on the unnecessary high design standards of local feeder roads and the resulting slow and uncertain rate of network development (Thruscutt, 1972); the unaffordability

and indeed non –availability of motor vehicles to the mass population and the neglect of effective policies for the development of local transport and vehicle system (Howe 1975).

The case for the development of low-cost vehicles to meet the special needs of rural people in developing countries was first brought into general debate at two conferences in 1976 immediately after the first oil- induced energy crisis (UNIDO, 1976; ITDG 1997). Though passing reference was given to the notion of low cost vehicles (Riversion and Carapetis, 1991), but till now there has been no significant follow up in the form of international or national investment policies designed to facilitate their production and distribution. Reliance has continued to be placed on market forces, which have sometimes actually resulted in the suppression of low-cost vehicle use, most notably the bicycle in Africa (Howe, 1995). The change in focus from road to the vehicle nonetheless served to broaden the discussion about rural transport planning, since it shifted attention away from the provision of infrastructure, towards the travel demand characteristics of users. The reason for this shift was predicated on the notion that existing transport planning processes were too focused on transport infrastructure alone rather than the needs of the people who use it, which led to a fundamental misunderstanding of the real nature of the movement demands for the majority of the rural population.

Therefore, a broader view of user travel demand characteristics started to emerge in the late 70s. Among prominent works at that time was a study of transport needs and constraints of rural farmers in Kenya financed by the World Bank (Howe, 1986; World Bank, 1997). The findings of this study and other related studies in Nepal and Bangladesh

were skeptical about the benefits that rural people were likely to derive from conventional road and motor vehicle based investments, and thus the whole basis of the rural transport development policies being implemented in developing countries. The findings showed that the rural travel demands of most small farmers are much more different from what was commonly supposed. Highlight of the findings indicated that most of the transport needs of the rural inhabitants involved the movement of small loads (10 -50kg) over relatively small distances (1-10km) (Barwell et al, 1995). Rarely were motorized

transport services available, affordable or even necessary for such tasks.

The results of these studies effectively destroyed the validity of infrastructure led approach for the provision of rural transport for the majority of the rural population. However, the studies did not produce a well-robust method of quantifying rural travel demands that might lead to more effective policy formulation. A better understanding of the rural transport demands and constraints require a more thorough analysis of the access needs of individual households. Similarly, for extremely poor households more prominence needed to be given to the transport demands associated with subsistence tasks. These requirements could only be met by quantitative and qualitative assessments of the nature of rural households travel characteristics – specifically their magnitude, frequency, duration, purpose, gender differentiation and the modes used.

The substitution of the household for the transport system as the fundamental unit of travel analysis enabled a conceptual leap in rural transport studies to take place. The first systematic use of the rural household as the basic unit of travel analysis in developing countries took place during the mid 80s in the course of three studies, two in Tanzania and one in Ghana (Barwell and Laggett, 1986; Barwell and Malmberg 1986 and Barwell and Howe, 1987). The study broadened the notion of rural transport which was redefined as “travel from home for any purpose and by any means of movement, including walking and carrying loads on the head and back”. The result was the quantification of household movements in terms of trips; time spent and distance traveled to various facilities such as supplies of water, firewood, health clinics, grinding mill, and market and gender analysis.

The result of these studies came as a surprise because subsistence transport clearly exerted a very big constraint on household productive capacity than had hitherto been thought. Methodologically the technique was a significant advance since a degree of precision in quantifying household travel demands was achieved. The methodology was further refined by studies in Tanzania, which were used as the foundation of intervention projects in Philippines and Malawi (ILO, 1988), with a view to defining a new planning approach to meet rural transport requirements.

The new approach was initially described as Integrated Rural Transport Planning (IRTP) but later renamed as Integrated Rural Accessibility Planning (IRAP). The difference between the two planning approaches is that while Integrated Rural Transport Planning focuses on ways to improve mobility through improved transport infrastructure and services, Integrated Rural Accessibility Planning (IRAP) recognizes that transport problems could be solved in two complementary ways; by increasing mobility through an improved transport system and by locating facilities and services closer to people.

In Nigeria, the planning of access needs of members of rural communities has followed this pattern as found in other developing countries. The focus has been on the extensive investment in feeder (rural) road construction. For instance, in the Ten-Year pre independence plan, provision was made for the construction of 25,600km of feeder roads (Nigeria, 1946). However, only 1536km length of roads was achieved. In both the first and second National Development Plans, rural roads construction received little attention from the federal government. However, many rural communities saddled themselves with responsibility of rural construction and maintenance (Ikporukpo, 1986).

The third National Development Plan witnessed massive construction of thousand kilometers of feeder roads by both the Agricultural Development Projects (ADPs) and the Directorate of Food Roads and Rural Infrastructures (DFRRI) (Lele et al 1989; Filani 1993). During this plan period some state government made concerted efforts to construct rural roads in their area of jurisdiction. For example, 23% of the total road length planned for construction in Ondo state during 1975-1980 plan period were rural roads (Olusogu, 1976). Similarly, of the N180 million earmarked for road construction in Lagos state during the 1988 financial year, about 38% of the amount was for the construction of rural roads (Lagos state, 1988). The result is the continuous increase in the length of rural roads in Nigeria which increased from 63,700 km in 1972 to 75,00km in 1985 , 108,700km in 1992 and 130.600km in 2000 (Filani and Osayinwese, 1974; World Bank, 1997 ; Adeniji, 2000 and CBN 2002).

Throughout this planning process and even now little attention (if any) is given to the

analysis of the access needs of the households. The consequence is the failure of the access intervention to have significant positive effects on the mobility of the rural population; since the intervention was not based on any meaningful scientific studies or on the views and opinions of the rural populace. Effective rural access intervention, therefore, requires a comprehensive analysis of the access problems of the households as well as the participation of rural inhabitants. The use of Integrated Rural Accessibility Planning (IRAP) in addressing the access needs of rural inhabitants in the country would not only enhance rural accessibility but also provide a solid foundation for sustainable rural development.

3.0 Integrated Rural Accessibility Planning (IRAP).

Integrated Rural Accessibility Planning (IRAP) is a need-based, local level planning tool that seeks to address the access needs of the rural people in a cost effective manner with the purpose of improving access to socio-economic services (Howe 1997; Republic of Malawi, 2001). Its aim is to ensure that infrastructure investments are directed towards the most urgent of rural communities. IRAP is a pro-active planning tool that enables the planner to take objective decisions based on data collected at village and district level. The planning approach guides the user in identifying the access needs of households and the most appropriate interventions to reduce transport problems. The process is participatory because it takes into account the views and opinions of the rural inhabitants. In a nutshell, IRAP methodology leads to the development of comprehensive information on the location, condition and use of rural infrastructure and services, identifies appropriate access interventions and priorities investments.

The Integrated Rural Accessibility Planning process varies slightly by country, it generally consists a series of steps grouped within five main sets of activities. These include data collection and analysis, mapping validation and access problems, prioritization of access problems, appropriate intervention as well as monitoring and evaluation of impact. These steps are briefly explained below.

4.0 Data Collection and Analysis

The basis for the decision making process is the data collection exercise. The purpose of this activity is to accumulate reliable information on accessibility in all relevant sectors- the data collected builds the foundation for the accessibility planning procedure. Information to be gathered includes accessibility to various socio-economic facilities among others. The data analysis makes use of Accessibility Indicator (AI) which shows the relative degrees of difficulty or ease with which households access goods and services. The indicator quantifies the size of the demand from households and the degree of transport burden in a given area. Accessibility Indicator is normally used to quantify access to locations of water, fuelwood, grinding mill, farm plots, schools, clinic among others. The formula is as follows:

$$AI = TT^1 * HH$$

Where

HH = Number of households permanently residing in a given village, ward or area under consideration.

TT = Travel Time or Transport Time that an average household spends to reach a facility or service.

The bigger the value of AI, the greater the problem.

For instance, if there are 40 households in a village who have to travel to get to water, and the average time for a return trip is 120 minutes, then the Accessibility Indicator for water in that village would be $40 * 120 = 4,800$. From the planning point of view, the accessibility indicator will show which villages have more access problems for specific needs. For instance, different villages will have a different score for a certain source. A village scoring highly on water will mean that the amount of time taken to get to water point is very substantial or there are more people who have to travel to get to water point, or both. It would therefore have a higher priority for improving access to water relative to another village with a smaller score.

In order to bring out gender perspective these scores should be differentiated on the basis of men and women. They should also be weighted according to the means of transport used since, for example, a longer trip by bus would score lower in accessibility problems than a shorter distance traveled on foot over steep hills. Such accessibility would be based on :

No of women * time taken* score for means of transport

No of men * time taken* score for means of transport.

The more difficult the means of transport the higher the score

e.g

walking on steep hills = 5

walking on flat terrain = 3

using donkeys = 2

using motorized vehicles = 1

4.1 Mapping and Ranking of Access Problems

The next step is to map the area. Since the transport planner is concerned with geographical areas (Village, ward, and district) and much of the information is connected with the physical infrastructure or locations of facilities, a map is the best tool to present and visualize the situation. Accessibility Mapping is an important tool of the IRAP process, and is a prerequisite for visualizing the spatial nature of rural accessibility. Mapping helps both the planner and the communities concerned to explain, discuss and understand the different aspects of access, as well as the impact of potential interventions. The application of Accessibility Mapping varies from simple sketches on the ground, to professional paper maps with overlays and full Geographical Information Systems (GIS). Representatives of the communities are strongly involved in this stage as well, resulting in a consensus regarding the prioritization of the encountered accessibility problems.

4.2 Intervention Stage

The next step is to identify the most appropriate interventions to meet each access need. The main aim of accessibility planning is to reduce time, cost and effort needed by rural people to gain access to essential services and facilities. Therefore, intervention for addressing rural access problems can be grouped into two categories. The first one is mobility enhancing interventions (improving rural transport infrastructure and services) and the second one is spatial planning for the location of services and facilities. This deals with optimum location of facilities relative to the communities they serve. Such interventions are aimed at reducing

rural travel. The essence of rural access planning is to look at the whole range of possible solutions and provides an opportunity for selecting one or a combination of the most appropriate ones.

According to Howe (1997), to assess the local appropriateness of the different interventions, an AAAAS-test is carried out. The interventions are evaluated with respect to their:

4.2.1 Adaptability – to the intended use and local conditions. It will show whether the interventions could be adapted to local inhabitants and the rural environment. This is a technical issue.

4.2.2 Affordability for rural communities – this has to do with the ability of the communities to pay for the investment and maintenance cost. Both the investment cost, which often can be covered by a loan or credit, and the operation and maintenance cost, which will affect the use of the intervention, are evaluated. This is an economic issue.

4.2.3 Availability in the rural areas concerned. If the intervention is not readily available in the area, the actions and resources required to make them available are identified by for example establishing supply channels. For instance, if materials needed for roads maintenance are not available in the rural communities, then supply methods are identified for bringing them into the rural communities. This analysis also favours interventions using locally available designs and materials.

4.2.4 Acceptability by the rural communities- Normally technologies and practices already in use are built on rather than being replaced, since changing cultural habits requires time and education. This is very important in the rural environment because rural people do not readily accept new technologies in the developmental programmes. Rather, they prefer such ideas/ technologies to operate within the framework of their conventional knowledge.

4.2.5 Sustainability – Sustainability of the intervention is analyzed in two respects: (i) in terms of maintenance systems available to keep the intervention itself in operation; and (ii) effects on the environment that may negatively influence the sustainability of the intervention itself or other parts of rural life. This consideration tends to emphasize, where feasible, increased use on Intermediate Means of Transport (IMT) and paths and track.

4.2.6 Implementation, Monitoring and Evaluation.

The last stage is the implementation, monitoring and evaluation stage. There is the need to define a system for monitoring and evaluating impact of the actions that are implemented. For each intervention a project is prepared and systems are developed to monitor the impact on accessibility. In the project design it is important to take into account the participation of local people and contractors in the implementation, thus resulting in additional benefits in the form of employment and incomes. Also an appropriate maintenance system needs to be put into place to ensure the sustained improvement of the access situation.

5.0 Conclusion

Rural access planning in most of the developing countries especially Nigeria has focused extensively on extensive road infrastructure development for motor vehicles. The failure of this approach to yield desired results led to the adoption of low-cost vehicles for rural mobility. However, a broader view of user travel demand characteristics that emerged in the 70s cast serious doubts on the benefits the rural people were likely to derive from the previous approaches. A conceptual leap was achieved in rural transport planning with the adoption of household as the fundamental unit of travel analysis. The result was the ability to quantify rural travel characteristics in various ways.

Although some measures of success were recorded at the initial stage but later findings showed that these transport policies were implemented through top-down approach. The result was that the outcome could not provide sustainable transport solutions to the access needs of the rural people, because such interventions were not based on the views of the rural populace. Any sustainable solutions to the access need and mobility constraints of the rural communities must be locally initiated and implemented. Integrated Rural Access Planning provides opportunity for this to take place.

IRAP has proved to be a very useful tool for local authorities in determining the access needs of rural communities and in identifying and prioritizing possible interventions. It has demonstrated its adaptability to different contexts and objectives, as is clearly demonstrated by the variety of formulas that exist for calculating the

Accessibility Indicator, all of which are based on the same foundation. The simplicity of its use in combination with the strength of its analytical ability has resulted in its adoption in various countries for local level planning systems. It is therefore imperative that the adoption of this important approach might be the option needed for solving the mobility problems and the seemingly intractable rural accessibility constraints in the rural areas in the country.

Endnote

- 1 It could also be Travel Distance or Travel Cost.

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