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*Full Length Research Paper*

# Prioritization of rural access for economic development in Zamfara state

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**ABSTRACT:** Accessibility can be regarded as a measure of how easy a place is to get to in less time and minimum effort, while Mobility is a measure of the ease with which people can move around. Lack of accessibility and mobility could lead to isolation, which consequently impedes access to basic health, education, safe drinking water, and other social services and economic activities. The objectives of Rural Access and Mobility (RAM) are to improve basic infrastructure, alleviate poverty and create an investment-friendly environment. Adopting the principle of basic access approach and the use of the multi-criteria method (MCA) of prioritization of potential interventions, a number of rural roads within Zamfara State were identified, screened, and ranked according to pre-set criteria of selection. Nine roads were selected out of the general inventory data of rural roads analyzed in the State. Detail existing condition data of the selected routes were documented and presented to allow for the preliminary cost estimate for future interventions.

**Keywords:** Accessibility, infrastructure, prioritization, interventions

## INTRODUCTION

Studies in Rural Travel and Transport have identified four important movements related to rural transport, topmost in importance are the movements associated with activities basic to human survival. Following closely are the movements by rural dwellers to markets and social facilities these movements are regarded as movements within rural areas by rural dwellers.

The other two important movements relates to movements out of and into the rural areas by the rural dwellers and the outsiders respectively (Jones and Parry, 1993). A greater percentage of Nigeria's population is rural; these rural dwellers are dotted across the country in small settlements and villages engaged in one or more forms of agricultural productions. Agricultural production sites are often isolated from markets and social centres due to lack of supporting infrastructure. Rural Access and Mobility Project (RAMP) is aimed at providing basic access to connect the teaming farming population through the provision of adequate transport facilities with consequent positive impact on socio-economic empowerment and poverty alleviation (African Development Fund, 2007).

### Aim and objectives of the study

The aim of the study is to provide basic access to the teaming farming population. Closely tied to the above aim, the objectives of the research project are as follows:

(i) To perform a critical review of existing rural within each local government in Zamfara state.

(ii) To determine the most viable route per local area in respect to food security, minerals, social amenities, market e.t.c along each route.
(iii) To investigate the prioritized routes condition, carrying out condition survey and feasibility studies.
(iv) To evaluate the economic feasibility of the proposed selected routes and provide platform for the required Bill of Engineering Measurement and Evaluation (BEME).
(iv) To recommend avenue for use of the developed rural roads prioritization for economic development.

## METHODOLOGY

To achieve the stated objectives of RAMP, broadly speaking the adopted methodology considered the following: documented data collation and desk study, project prioritization, stakeholder's workshop, field reconnaissance survey of selected routes, data/economic analysis of selected routes, documentation. The adopted methodology was aimed at efficient harmonization of the key project milestones in relation to available human resources, equipment and time utilization towards the delivery of the project (Keller and Sherar, 2003).

### Desk study

A better comprehension of the state's economic potential is a key step towards identifying possible areas of intervention. The desk study allows adequate, data entry and management as well as delineation of the state into the identified intervention areas in line with the existing senatorial zones and local government councils within the State (Hindson, 1983).

### Reconnaissance survey of selected routes

With the list of roads properly ranked from the prioritization exercise and ratified during the stakeholder's workshop, visual condition surveys of the priority interventions were conducted.
The objectives of the reconnaissance survey include but not limited to the following:

(a) Carrying out the detailed route alignment survey to assess and document the physical condition of the horizontal and vertical alignments of the existing route.
(b) Locating and documenting all natural features such as farmlands, water courses, gullies, rock outcrops swampy ground etc.
(c) Locating and documenting all connecting settlements, existing structures, basic amenities, and utilities etc.
(d) Locating and documenting all existing and proposed drainage structures

### Collated data

Available data collected for the desk study from the RAMP state offices, the various agencies in Zamfara state as well as private sector operators includes but not limited to the following:

(i) The National Economic Empowerment Development Strategy (NEEDS)
(ii) State Economic Empowerment Development Strategy (SEEDS)
(iii) National Policy on Rural Travel and Transport (NPRTT)
(iv) Administrative map of Zamfara state (inclusive of road network)
(v) Geological map of Zamfara state
(vi) General specifications for roads and bridges
(vii) Road sector budget for 2009
(viii) Zamfara state budget for the last three (3) years
(ix) State population and projection figures

### Data entry and management

Data collected in both hard and soft copies were carefully stored and managed by the overall project coordinator while copies were released to the various state project team leaders as the work progressed. A comprehensive inventory data of the existing and proposed Rural Infrastructure, was designed with data categorized based on senatorial zones to local governments and down to specific projects (Mc Elvany and Snaith, 2002).

### Project prioritization

At the heart of this project implementation, is the prioritization of candidate projects leading to selection of high priority rural infrastructure. The approach adopted for the prioritization of potential projects considered holistically the mobility and accessibility needs of rural communities. Accordingly three elements which include a-transport services, b-location and quality of facilities and c-transport infrastructure were tailored to suit a selection process leading to a transport system targeted at serving the teaming farming population fulfilling one of the main objectives of RAMP (Airey and Taylor, 1999). Project Prioritization was divided into two broad headings of Screening and Ranking as follows:

### Screening

An important assumption in screening of potential projects was the priority accorded to the identified foot paths followed by unpaved Rural Infrastructure. The central idea behind this assumption is consistent with the Basic Access approach, which gives priority to the provision of reliable, all-season access to as many villages as possible, in favour of upgrading individual links to standards higher than Basic Access. The first stage of the screening targeted all existing paved roads

from a prepared general inventory. Irrespective of Road Class, all existing paved roads were screened out; the process formatted the data entries classified according to Senatorial zones, local government, Local population, project name, Surface type etc. Secondly the documented construction status of projects determines inclusion or otherwise of a given project to the next stage of the prioritization process.

**Ranking**

A Multi-Criteria Analysis (MCA) approach was adopted in ranking potential projects. As it is practically time consuming and uneconomical to collate data for all the screened candidate roads before final selection, the adopted ranking criteria was considered in favour of both the Cost-Effectiveness Analysis (CEA) and the conventional Cost-Benefit Analysis (CBA) Methods (Parry, 1992). Four broad areas were considered in the development of priority indices as follows:

(i) Economic Criteria
(ii) Access to Basic Social Amenities
(iii) Local Population
(iv) Environmental Sustainability

Details of the above points including assumptions governing the award of marks for sub criteria are hereby presented below.

**Economic criteria**

Economic benefits associated with engineering projects takes centre stage in justification for project implementation. In this context an important objective of the study is to reduce poverty through agricultural production and eventual marketing. Because of its relative importance to the objective of RAMP project, the economic criteria indicator carries an allotted maximum overall mark of 50% which sub characterized in (Table 1). Access to Farmlands and Fishing sites carries 5 score, Access to Food security/Commercial Agric. Sites with 15 score, Access to Fadama II/III Programme sites with 10 score, Access to Farm produce Markets with 10 score and Availability of Mineral resources carries 10 score. It is believed that a good economy could be a driver to other social services like in areas of health care delivery and, Education. Accordingly potential interventions were scored based on the strength of five indicators (Larcher, 1992).

**Access to basic social amenities**

If economy could be the driver of prosperity, its first beneficiary is the social service sector. An access is required where basic health, water and educational facilities are located. This criteria indicator attracts an overall mark of 25% which represents half of the economic criteria contribution and a quarter of the overall score for a potential intervention (Iebo and schelling, 2001).After the score for individual sub criteria under this indicator. Thereafter a brief justification for the individual sub criteria follows as Linkages to existing network was allocated 10 score, Access to Educational facilities assigned 7 score, Access to water resources assigned 5 score and Access to basic health facilities assigned 3 score as in (Table 2).

**Access to educational facilities (AEF)**

The project team is of the view that access to educational facilities ranks second to improving basic infrastructure as such attracts a mark of 7%.

**Access to water resources (AWR)**

As commonly observed ***"water is life",*** access to water resources ranks second to education and ahead of health, because communities with good drinking water are more likely to be healthier than those without such facilities. This indicator attracts a score of 5% as a contribution to the social amenities criteria.

**Access to basic health facilities (AHF)**

Presence of an existing health facility along a potential route attracts a mark of 3%, the lower mark on the hierarchy of social criteria borders on the assumption that, a community which possess all the preceding indicators, is more likely to access health facilities.

**Local population**

The population density of the project benefiting communities could be an important factor in selecting projects. Numerical strength determines the direction of voting pattern in democratic settings. High population could mean more people desire access to services. It is noteworthy that, population served by a project is an important parameter utilized in the Cost-effectiveness method of ranking potential interventions (Odoki et al., 2008). From the projected 2006 Zamfara State census figures, statistical boundaries were determined leading to a definition of High, Medium or Low population. Accordingly respective scores which are mutually exclusive were assigned as according to the criteria below, considering High Local Population >200 with 15 score, Medium Local Population 100 – 200 with 10 score and Low Local Population 0 -1000 with 5 score as in (Table 3).

**Environmental sustainability**

The importance of environmental impact of projects on the benefiting communities carries a maximum of ten

**Table 1:** Economic criteria for project ranking.

| Economic Criteria Description | Abbreviation | Score (%) |
|---|---|---|
| Access to Farmlands and Fishing sites | FFS | 5 |
| Access to Food security/Commercial Agric. sites | FSS | 15 |
| Access to Fadama II/III Programme sites | FPS | 10 |
| Access to Farm produce Markets | FPM | 10 |
| Availability of Mineral resources | AMR | 10 |
| Total Score | | 50 |

**Table 2:** Access to basic social amenities ranking criteria.

| Access to basic Social Amenities | Abbreviation | Score (%) |
|---|---|---|
| Linkages to existing network | LEN | 10 |
| Access to Educational facilities | AEF | 7 |
| Access to water resources | AWR | 5 |
| Access to basic health facilities | FPM | 3 |
| Total Score | | 25 |

**Table 3:** Population ranking criteria.

| Local population criteria | Range(Million) | Abbreviation | Score (%) |
|---|---|---|---|
| High | >200 | H | 15 |
| Medium | 100 – 200 | M | 10 |
| Low | 0 -1000 | L | 5 |
| Maximum Score | | | 15 |

**Table 4**: Environmental impact ranking criteria.

| Environmental sustainability | Abbreviation | Score (%) |
|---|---|---|
| Friendly | F | 10 |
| Mild | M | 5 |
| Hash | H | 0 |
| Maximum Score | | 10 |

**Table 5:** Summary of obtainable ranking marks.

| Priority Index | Score (%) |
|---|---|
| Economic Criteria | 50 |
| Access to Basic Social Amenities | 25 |
| Local Population | 15 |
| Environmental Sustainability | 10 |
| Maximum Score | 100 |

marks. In this context the project team classified the level of environmental impact into friendly, mild or hash as presented (Table 4). A project is considered friendly where there are no substantial negative impacts to the benefiting communities. An environmental impact is considered mild if the negative impacts can be easily reversed after the project implementation. Where the impact of project involves for example relocation of a whole community such a project is considered to be harsh earning a score of 0% (Table 4).

**Priority in indices and ranking of potential interventions**

Using excel spread sheet named the Ranking table (Table 5) individual interventions were scored in accordance to the priority indices detailed above. The first ranking table shows the maximum marks scored by individual projects which are the summation of the four priority indices. Obtainable marks from these indices are summarized in (Table 5).

**Table 6**: Summary of general project inventory.

| Road Class | Surface Type | No of Roads | Approx. Distance(Km) |
|---|---|---|---|
| | Paved | 7 | 885 |
| Federal | Unpaved | 1 | 150 |
| | Paved | 15 | 209.52 |
| State | Unpaved | Nil | Nil |
| | Paved | 13 | 136.5l |
| Local Government | Unpaved | 174 | 1,659.615 |

**Table 7.** Prioritized rural roads.

| S/N | Senatorial District | L.G.A | Project/Route Name | Surface Type | Approx. Length (km) |
|---|---|---|---|---|---|
| 1 | Zamfara North | Kaura Namoda | Kaura Namoda - N/Godel – Birnin Magaji | Unpaved | 42.25 |
| 2 | Zamfara North | Zurmi | Moriki - Dutsi - Yanbuki – Jabanga | Unpaved | 39 |
| 3 | Zamfara North | Shinkafi | Jangeru - Badarawa – Kware - Kurya - Mashema – Store Road | Unpaved | 31 |
| 4 | Zamfara Central | Gusau | Gidan Mai Mani - Gidan Gabi – Gidan Musa Zule - Bakinwa Wanke | Unpaved | 24 |
| 5 | Zamfara Central | Maru | Dansadau - Mutunji | Unpaved | 18 |
| 6 | Zamfara Central | Bungudu | Keku - Bingi | Unpaved | 18 |
| 7 | Zamfara West | Talata Mafara | Mafara - Sauna - Morai - Kagara | Unpaved | 34 |
| 8 | Zamfara West | Bukkuyum | Ruwan Jema - Dogaye - Kuruwa | Unpaved | 27 |
| 9 | Zamfara West | Bakura | Yarkufoji - Bakura | Unpaved | 11.865 |
| Total Length of prioritised projects | | | | | 214.115 |

## Initial prioritization

## Screening of potential priority interventions

The prioritization process includes screening and ranking of potential interventions. The first stage of prioritization is the screening exercise which can be likened to removal of outlier interventions based on the adopted screening criteria. As at the time of data collation and reporting, a total of 1,035km of Federal road, 209.52Km of State road and 1,796.125Km of local government roads were recorded in the general inventory. Henceforth candidate roads were screened. At the screening stages identified projects which are already surfaced, newly constructed or undergoing construction by other agencies were screened out (Table 6).

## Final prioritization of projects

## Ranking of potential projects

A total of nine (9) projects approximating to about 214.115Km of rural Local Government roads were selected based on candidate scores. Table 7 presents the summary of selected interventions through ranking of candidate projects. It is noteworthy that, a review of these selected priority project list became necessary while on reconnaissance survey due to the actual situation encountered on site which may require reconsideration of other equally likely route alternatives.

## Conclusions

On the course of this study, it is extremely revealing to observe the scale of isolation and the need for Accessibility and Mobility prevalent within the rural farming population in the North-western region of Nigeria. From the initial Desk study to the subsequent reconnaissance survey of selected routes and the overall appraisal exercise have shown that RAMP replication in the Northwest is technically feasible, environmentally sustainable, socially and economically justifiable. In line with the National Policy on RTT and the objectives of RAMP, the proposed project has the potential to impact positively on rural transportation, thereby enhancing the

movement of goods and services, poverty alleviation and improvement to basic infrastructure within the benefiting communities. It is noteworthy, the level of enthusiasm exhibited by the stakeholder communities signifying greater local support to the proposed project sustainability and eventual maintenance.

## Recommendations

(i) It is recommended that the Federal Government in collaboration with States, Local Governments and other donor agencies should commission consultants to undertake the Topographical Digital mapping of the nation's rural communities. This will go a long way in bridging the gap of data inaccessibility, reliability and affordability for the successes of future project implementations.

(ii) In project of this nature, it is paramount for the awarding agency to specify possible limiting criteria in terms of the project length, cost or absolute importance to socioeconomic development.

(iii) It is expected that the adopted limiting criteria shall consider the economics of available resources and adequate distribution of projects with the aim of maximum positive impact to the socioeconomic well-being of the benefiting communities.

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