ACADEMIC INN INTERNATIONAL

SOUTH ASIAN JOURNAL OF DEVELOPMENT RESEARCH

open access

ENVIRONMENTAL IMPACTS OF ROAD CONSTRUCTION

Ajala Christianah Oluwamayowa, Oladokun Benjamen Niran, Olawuyi Lawrence Olayinka and Jimoh Kazeem Adeyinka

To cite the article: Ajala Christianah Oluwamayowa ,Oladokun Benjamen Niran, Olawuyi Lawrence Olayinka, and Jimoh Kazeem Adeyinka (2019). Environmental Impacts of Road Construction, *South Asian Journal of Development Research*, 1(2): 98-113.

Link to this article:
http://aiipub.com/journals/sajdr-190801-021015/

Article QR

Journal QR

ENVIRONMENTAL IMPACTS OF ROAD CONSTRUCTION

[1*]Ajala Christianah Oluwamayowa, [1]Oladokun Benjamen Niran, [2]Olawuyi Lawrence Olayinka and [3]Jimoh Kazeem Adeyinka

[1*] Department of Urban and Regional Planning, Ladoke Akintola University of Technology, LAUTECH, Ogbomosho, Oyo State, Nigeria
[1] Chemistry Department, University of Abuja, FCT, Abuja.Nigeria
[2] Department of Urban and Regional Planning, Ladoke Akintola University of Technology, LAUTECH, Ogbomosho, Oyo State,Nigeria
[3] Department of Urban and Regional Planning, Ladoke Akintola University of Technology, LAUTECH, Ogbomoso, Oyo State,Nigeria

Corresponding Author: christianaholuwamayowa@gmail.com

ARTICLE INFO
Article Type: Short communication
Received: 09, July. 2019.
Accepted: 01, Aug. 2019.
Published: 01, Sep. 2019.

Keywords:
Rural area, Road construction, Environment and Impacts

ABSTRACT
Road construction is a phenomenon that is associated with diverse processes and activities. Various urban and rural settlements have experienced road constructions due to some benefits that were attached to it such as development, aid communication, boosting of socio-economic and aesthetic among others. However, little or no consideration is given to the environmental impacts of it, despite the fact many road projects embarked upon in Nigeria have environmental impact assessment, yet it seems so impressive on paper without adequate measures. Various authors have come with several impacts of road constructions on the environment but the paper gives more insight on the environmental impacts of federal rural road construction from Itawo-Okin village. The road project cut across four villages (Itawo, Jakilegbo, Akatapa and Okin). The study revealed both positive and negative impacts of this road project on the residents while it disclosed the direct and indirect impacts of it on the environment. Likewise, way forward was suggested based on the identified problems in the study areas.

1. INTRODUCTION

Roads originated for economic reasons, related to the need to move food and other goods from one point to another. Early transportation focused on moving food from a hunt or a harvest to the places where people lived. Trails evolved from prehistoric animal paths, and early humans carried or dragged their loads along these paths. As humans learned to domesticate animals, they transferred their loads to pack animals, such as horses, mules, camels, llamas, elephants, and dogs (Microsoft Encarta, 2009).

Presently in Nigeria, road transportation served as essential part of life that is necessary for day to day activities of man out of all modes of transport. It serves as the framework or skeleton of any settlement plan and also provides the arteries and veins for the influx and efflux of commuters, freights and ideas. Roads are used by both the vehicular traffic and

pedestrian traffic and beneficial to all classes of people in Nigeria. Road transport complements other modes of transport because of its flexibility and ability to render door-to-door services. However, rural roads are one of the two broad categories of roads that is, urban and rural roads (Okoko, 2006, Abdulkareem, 2014).

In constructing the rural roads, it requires the creation of a continuous right-of-way, overcoming geographic hindrances and having grades low enough to permit vehicle or foot travel. This implies that, such road must be designed and built for primary use by vehicular and pedestrian traffic (Wikipedia, 2014). It is no longer visible to disregard the desires of the general public. The more we planned our environment, the healthier our environment will be since the condition of the environment ascertains the wellbeing of the occupants.

Every human activity creates inevitable environmental impact but the ability of people and societies to adapt and cope with the changes varied. If we destroy the environment, we are indirectly ruining our lives and the rest of creation (Shyllon, 1989). The inhabitants in the developing countries have less capacity to adjust to change and more exposed to environmental threats and the global change. Poverty is generally documented to be the most imperative reason of susceptibility to environmental threats because the poor tend to have much lower coping capacities than the wealthy people. Therefore, they tolerate the burden of the impacts such as disaster, conflicts, drought, desertification, and pollution among others.

Part of the human activities considered in the context of this paper is road construction in rural area. Evidences have shown in the existing body of literature that the environmental impacts of it is inevitable despite enormous benefits derived from it.

According to Wikipeadia (2014), the environmental impact of roads (both positive and negative) include the local effects of highways (public roads) such as on noise, water pollution, habitat destruction/disturbance and local air quality; and the wider effects which may include climate change from vehicle emissions. The design, construction and management of roads, parking and other related facilities as well as the design and regulation of vehicles can change the impacts to varying degrees (Environmental Protection Agency, 2008; Wikipeadia, 2014).

Forman and Alexander (1998) buttressed the above facts that, roads can act as barriers or filters to animal movement and lead to habitat fragmentation. Many species will not cross the open space created by a road due to the threat of predation and roads also cause increased animal mortality from traffic (Philip et al., 1998; Primack, 2004). This barrier effect can prevent species from migrating and recolonizing areas where the species has gone locally extinct as well as restricting access to seasonally available or widely scattered resources (Primack, 2004).

Habitat fragmentation may also divide large continuous populations into smaller more isolated populations (Forman and Alexander 1998). These smaller populations are more vulnerable to genetic drift, inbreeding depression and an increased risk of population decline and extinction (Primack, 2004). Another negative effect is the amount of space roads take up. When cutting through forests, they prevent the growth of many trees as trees cannot grow through paved roads. On unpaved roads, vehicle tires and foot traffic compact soil and prevent plant growth. As trees take up CO_2 and as they also house animals, this increases the environmental damage inflicted (Wikipeadia, 2014). Roads that run through forests that house edible animals may encourage poaching for personal consumptions and also for sales

especially in the poor areas. Similarly, the construction of roads in forested areas can also promoted illegal logging as it becomes easier for illegal loggers to transport the wood (Wikipedia, 2014).

As a result of these problems and all other related problems emanated due to human activities, an enormous amount of work has been done on environmental sustainability. But the measures and controls suggested seems impressive on paper without full implementation.

Conversely, there is no doubt that road construction in rural areas will have significant impacts on fighting rural poverty. But the environmental impact of such road project cannot be underestimated, for it has direct and indirect impacts. Various researchers have come up with different opinions on the impact of road construction, their views differ in formation but they are closely in concept and have advanced scientific and technological knowledge which help to increase the understanding. Parts of the positive impacts identified by the scholars include development and improving the standard of living among others. While the negative impacts include deforestation, loss of plant species, pollution, habitat destruction, climate change and other wider effects.

For more meaningful learning about the impacts, therefore the paper focused on the likely environmental impacts of the federal rural road construction from Itawo to Okin village. The study aimed to examine the residents' perception towards the road project as well as the impacts of it on them and the environment generally. The specific objectives are to: (i) assess the socio-economic characteristics of the dwellers; (ii) assess the residents' satisfaction on the road project; (iii) examine the effects of the road project on the residents' and their environment and (v) proffer planning recommendations towards the identified problems.

2. METHODOLOGY

The method used in achieving the aim and objectives stated earlier are primary and secondary data. The primary data was obtained from the field through reconnaissance survey, personal interview, and observations and focused group discussion. These enabled the researchers to know the magnitude of the work to be done and hereby paved way for suggestions of the approaches to tackle problems that was identified. It also disclosed the effects associated with the road construction and the likely impacts of the project on the residents as well as their environment.

The focused group session was conducted in four villages that are found along the road project. These villages are Itawo, Jakilegbo, Akatapa and Okin villages. These were conducted among the village elders and 'Mogaji' of each settlement. Their responses on the road project and general wellbeing were recorded using phone recorder and later transferred to writing format.

Equally, the secondary data was acquired from the published and unpublished materials, dissertations, seminar papers, newspaper and journals that are relevant to this study. Maps are gotten from Surulere Local Government Area to show the location of the study area and photographs were taken to show the existing situation. Global Positioning System (GPS) of a mobile phone was used to take the coordinates of the four villages and the distance covered.

2.1 Geographical location

'Okin' and other three settlements are located on southwestern part of Nigeria within the context of Ogbomosho, Oyo state. They are situated in Surulere Local Government Area of Ogbomosho. Okin is about 7km from the junction of 'Ogbomosho-Iresa road', 3km from

'Akatapa', 3.7km from 'Jakilegbo' and 5.5km from 'Itawo'. Okin is located at latitude 8.0505^0N of the equator and longitude 4.2855^0E of the Greenwich meridian with the attitude 350mm.

Akatapa is about 4km from the junction of 'Ogbomosho-Iresa road'. It is located at latitude 8.0708^0N of the equator and longitude 4.2958^0E of the Greenwich meridian with the attitude 382mm. Jakilegbo is about 3.3km from the junction of 'Ogbomosho-Iresa road'. It is located at latitude 8.0745^0N of the equator and longitude 4.3013^0E of the Greenwich meridian with the attitude 388mm. Itawo is about 2.5km from the junction 'Ogbomosho-Iresa road'. It is located at latitude 8.0848^0N of the equator and longitude 4.3132^0E of the Greenwich meridian with the attitude 399mm. The soil types found in these settlements are clay, sandy and loamy soil. These soils are rich and capable of supporting vegetation growth as well as good for planting.

3. RESULTS AND DISCUSSION

The essential of planning and plan invention in rural areas indicate the need to examine the impacts and responses to the road project within the settlements that comprise the households and the head of the villages i.e. 'Mogaji'. Precise declaration of some villagers' are emphasized for urgent solution. We investigated their satisfaction and the effects of the road construction on them; their perception on the infrastructural facilities generally and their socio-economic characteristics. However, the focus group sessions coupled with physical observations in the four villages provided the basis for discussions and findings summarized below.

3.1 Responses on socio-economic characteristics

The interactive session with the Mogaji's and the villagers revealed that male are more in Itawo and Jakilegbo village while female are more in Akatapa and Okin village. In response to this, the Mogaji of Okin declared:

> *"We know ourselves in this village, we are not too many. Most of our children are not living with us here. Some of them are in Ogbomosho town while some are in other part of Nigeria. In fact am happy to tell you that only six persons have car in our village but I personally do not have any one. Most of us here are farmers including our wives at times and sometimes our small children especially during harvesting periods. If they are in school, we took permission from the headmaster of the school…."*

Similarly, the above fact is applicable to other rural settlements. They declared that they know themselves to the extent of revealing the number of those that have cars and motorcycles. For instance, only 3 persons have motorcycle in Itawo and Jakilegbo village while none of them has a car. Likewise, evidences shows that most of them engaged in farming. The ages residing there are between (5- 96years), but the dominate people are between 40-70years. There are single, married, widow and widower in all villages but it varies in each settlement. For instance, widowed and widower dominated Itawo and Jakilegbo village while married and single dominated Akatapa and Okin village.

In terms of religion, the study revealed that most of the residents practices Christianity and they are Yoruba's. The educational status in those villages is formal education except their upcoming children and those that are schooling outside the villages. In response to their monthly income, one elderly woman in Itawo village declared:

> *"I am selling cooked food to the villagers and the laborers on the site from*

Monday-Saturday. My earned income per month depends on the market sales but the minimum income is ₦5,000 and maximum is ₦10,000 per month…"

Similarly, those that are farmers indicate between (₦5,000 - ₦15,000) per month depending on the market sales too. Considering their income level, one can actually say that their monthly income is generally low. In other to manage their income, sub-standard houses are built while the rest is spent on their household to survive. Thus, little or no consideration is given to the improvement of housing facilities that can improve the quality of their living.

3.2 Household Responses to Infrastructural facilities

It is generally believe that infrastructural facilities, utilities and services are the bedrock of productivity in any settlement. But it is unfortunate that these villages are lagging behind in terms of infrastructural facilities, utilities and services. There is nothing to write home about these villages especially water and electricity. The focus group discussions in these villages indicates that most of the residents dwell more on well and river/stream as a source of water. All the boreholes dug in these villages are not functioning except one (hand-pump) in Okin village (1 of 3) that is functioning. This borehole served the remaining the neighboring villages and it is their only source of drinkable water. Whenever, it has fault, it was the villagers that contributed money to repair it. In buttressing this fact, one elderly woman in Akatapa village lamented:

"We do not have potable water in our village, for we make use of well water during rainy season. When dry season comes, we trek down to Okin to fetch from their stream and borehole for drinkable water and domestic use. And at times their stream may be filled with cow dung which makes difficult for us to use it for cooking. Please, kindly assist us in our village"

Similarly, one of the first settlers in Jakilegbo village said:

"Before, our village has enough wells that served all of us but now only one is functioning but not sufficient and it depends on the season. In substitute for it's insufficient, we all depend on the neighboring water for survival. Imagine, we have to walk for almost 4km to Okin village to fetch from their only functioning hand-pump water for drinking and their wells including their stream for domestic use. Please kindly assist us here."

However, Itawo village is not exceptional for they have similar problem with other settlements. They trekked to the remaining three villages to fetch water for drinking and domestic use. In Okin village, their 'Mogaji' lamented:

"Three boreholes were constructed in our village by the governments but only one is functioning and it is hand-pump. It is the villagers that repair the borehole whenever it has fault by contributing money per household head. We are doing this because it is the only main source of water for drinking and it serves other neighboring settlements. We queue to fetch it and based it on measurement and time to fetch. For instance, during dry season, each household has the right to fetch at least 2 buckets of water per day. Well water was only enjoyed during rainy season and depends more on our stream and river called 'odo oje' for domestic use during dry seasons. Help us plead with the government to help us in this village."

The two streams/rivers found in Okin village (Authors' field work, 2014)

In case of electricity, the focus group interaction revealed that only one transformer was erected in Okin village only but it has not for once show forth light in the village talkless of distributing to other villages. No traces of electricity poles in the villages except Okin. This implies that none of the villages have electricity presently. Although, 15 solar systems were recorded to be in Okin, 2 in Jakilegbo, Itawo and Akatapa respectively. But only one is functioning in each settlement and it is been repaired by the villagers whenever it has fault. In addition to this fact, 'Mogaji of Okin' in his residential lodge said:

> *"The transformer present in Okin has been there since year 2010 through Senator Ayo Adeseun. Then, i thought by now, the villagers would have been enjoying electricity but rather, the transformer has been a figure headed in my village. Although, Alapa of Okin is still working on it and I believed that one day, we will laugh at last"*

Another elderly woman in Okin declared that:

> *"I believed that the issue of this electricity was used to campaign to us because the first tenure of Senator Adeseun was when they brought the transformer. It was there without any fixing of wires till his first tenure lapse. Later on, he came to our village to campaign for the second tenure and promised the electricity for us. We voted for him and he later won. After he won, wires and poles that will distribute light to various buildings were fixed without flashing the light. Thereafter, we discovered that there was some problems right from the source which hindered us not to have electricity again. Since then, the project has been abandoned and we residents are hoping for a savior that will deliver us from darkness. Only God knows who is going to help us out…."*

The transformer donated to Okin village (Authors' field work, 2014)

On the other hand, the villagers wished to have secondary schools and more primary schools at least to those villages that do have anyone. Those villages that do not have any lamented that their children trekked to the neighboring settlement to study and after primary sessions they will either go to Ogbomosho town to further or stay in the neighboring settlements like Oko, Iresaadu and Iresaapa for their secondary schools only. Also, the villagers complained about difficulties in conveying their farm products from farm to neighboring markets like Oko, Iresaapa and Iresaadu among others. Those routes are not in good condition especially the one leading to Oko village is yet to be completed and it is very difficult to pass during rainy season.

Equally, the focus group discussion revealed that the villagers yearned for rapid, profitable and beneficial development in their various villages such as establishment of industry, health centres, banks, postal agency, car parks, police post, good accessibility and telecommunication among others. The physical observations also support the fact that all these mentioned earlier are not in attendance. For instance, during the reconnaissance survey, the researchers discovered that there was no mobile network except a partial network of Airtel in Itawo village.

3.3 Responses of households on waste disposal

In the four villages, there is no public facility for solid waste disposal. Many of them do not have access to good sanitary waste disposal system compared to Ogbomoso town. As a result of this, many families dumped their garbage in nearby stream, open-space, backyard and bushes. In response to this, an elderly woman in Okin village stated:

> *"Ever since I have been living here, I have not seen any environmental officer or waste truck to receive our wastes in this village. I poured my waste at my backyard as you can see it yourself and I defecated in the nearby bush…"*

The above statement indicates that, the residents that are practicing such system will not be far from contacting various types of diseases such as cholera, fever and malaria among others. And since majority of the buildings do not have toilet facility, definitely defecating around the residential building will not be rule out especially for the small children that may not likely to use the bush.

3.4 Reponses on drainage system

The state of drainage system in these villages is an eyesore; most of the buildings do not have a proper drainage in channeling their liquid wastes. Some channeled their waste water close to the next house while some runs theirs to the footpaths or backyards. In response to this, an elderly man in Akatapa village lamented:

> *"As you can see, my neighbor constructed his own bathroom (with iron sheet) beside my house. Whenever they bath, the waste water will run straight to the footpath next to my building. And I have complained times without number but nothing was done…."*

With the exception of the under construction of few block houses and the palace of 'Alapa of Okin', many of the buildings in the four villages posses the above facts and this can cause a great instance to the environment.

Drainage pattern in Okin village (Authors' field work, 2014)

3.5 Responses on the road project

There is no doubt that rural road construction will boost the development and economic growth of any rural settlement. Such road will effectively convey goods and people across considerable distances and it is essential to transport sector. Generally, there are several adverse impacts of road construction on the environment however, which must be considered during the planning, construction and maintenance of roads. But for this study, the impacts of the road project on the residents are classified as positive and negative impacts. While the environmental impacts of the road construction is categorized as direct and indirect impacts.

3.6 The impacts of the road project on the residents

The focused group session revealed that majority of the villagers are happy about the road project appreciating God for using Senator Adeseun for them. It was this man that fought for the villages at federal level to construct the road. The findings show that this road project is one of the three federal road projects that are awarded for Ogbomosho region in year 2014. PA/ETOS/LTD was the company that is handling the road project. The duration of the road construction is one year and this mean that the road is expected to be completed by December, 2014. The contractor phased the design of the road construction into two. The first phase covered 4km (Itawo-Jagilegbo-Akatapa) while the second phase covers 3km (Akatapa- Okin). Presently, the first phase is still under construction while nothing has been done on second phase except the measurement taking. However, some of the positive impacts mentioned by the villagers are stated below:

i. ***Widening of the firms markets:*** it will help to widen the firms market through its aids of movement of people and goods to the interior. It will enhance the location spread of markets, increase the size of the markets in terms of buyers and traders and turnover, leading to rise to toll revenue.
ii. ***Encouragement of international trade:*** it will greatly promote and encourage trading from one area to another. There will also be changes in the composition of goods and services traded and as well changes in the level of prices of goods exported from and imported into the area.
iii. ***Effective and efficient distribution of goods:*** it will facilitate and quicken the effective distribution of goods and services to their settlements. It will also increase the volume of output and rise in the level of productivity. Equally, it will increase diversity in products and services available locally.

iv. ***Prevention of wastage of perishable goods:*** Transporting the perishable goods on time to where they are needed prevents wastage e.g tomatoes, peppers e.t.c.

v. ***Movement of productive resources:*** it will aid movement of productive resources from their area to the area of producing unit where they will adequately make use of it.

vi. ***Development of specialization:*** road transport is one of the essential ingredients in the development of specialization and division of labour which make the mass production possible.

vii. ***Improved standard of living & create job opportunities:*** it will help to make goods and services to be available to them at the right time thus help to improve standard of living. It also will also lead to economic growth and create employment opportunites. However, residents is benefiting from the road construction through manual labour and some other things.

viii. ***Aids Development:*** it will greatly encourage the development of their settlements. Since transport is one of the landuses that makes other landuses possible. Therefore, it will form the intrinsic parts of the overall socio-economic and politics development of their area.

ix. It will also aids comfort ability, political influence and as well communication enhancement.

x. It will also provide safety, consistent transport system from other towns and enhances social interaction between communities.

xi. **It will facilitate social activities, education and other services:** When the roadway is opened for use, positive impacts result for many residents. Travel time and inconveniences will generally decrease. The roadway will increase access schools, stores, recreation and other community services. These effects can be reflected also in increased land values/property values and wages. It will also facilitates administration and as well overcome the separation between the producers and consumers.

On the other hand, as they are rejoicing over the road project, they are also bothered about the negative impacts it brought to them. In response to this, one elderly man lamented in Itawo village that:

> *"The indigenous occupying the land along the road axis will lose their right of occupancy to the federal government. All the buildings marked will be demolished including my home. According to the contractor, government has earmarked some amount of money for compensation but up till now we have not receive any money. Nevertheless, I personally will not allow them to demolish the only building that my forefathers left for me (O se mi, O nsi tun gba mi loro ijoba ode oni ri: Yoruba dialect)…"*

This implies that, the residents who their building is red-marked happen will probably experience partial or total demolition of their cultural heritage i.e. their house built with clay. Those that can afford will probably relocate to another place or build another building. The property loss may cause psychology problem among the residents and probably make such people to be homeless at the end of it.

Apart from building demolition and dislocation of the residents, the villagers also complained about their solar system poles, farmland and hand-pump water. In response to this, 'Mogaji' of Jakilegbo lamented:

"The project engineer told us that the only functional solar system in our village will be removed as you can see it was red-marked too. And this solar system you see serve as our light in this village since we don't have any electricity. Many of us will sit down under it to relax in the night, now they are going to remove it. We even plead with the contractor to divert the road a little, but he said it will be difficult….."

The same thing is applicable to other villages, the only solar system that is functioning in these village are red-marked for removal. A course of chart with the site engineer that is in charge of the road project told the researchers that what the villagers said was true about the issue of solar system and red-marked of the buildings. He further explained that the company even tries to do some road diversion through some calculations because virtually all the buildings that are clustered around the road project including a lot of farm lands will be affected. In addition to this, it is a pity that the only hand-pump borehole water that is in Okin will be affected. Okin villagers are seriously bothered about the water. In response to this, the site engineer declared:

"There is no escape route for this borehole, for it is sited on the road and we need to carryout our job. Although federal government has earmarked ₦20 million for compensation (for the four villages) but it has not reached us. The company only tried as much as possible to pay up those that lost their farmland during the course of action in the first phase. They calculated what is on their farmland and we paid what the company can afford. We are only doing this to help them…."

The marked hand-pump, solar system and buildings in Okin village (Authors' field work, 2014)

The marked solar systems and buildings in Jakilegbo village (Authors' field work, 2014)

The buildings and well earmarked for demolition in Itawo village (Authors' field work, 2014)

Clearing of the farmland for the road project in Itawo village (Authors' field work, 2014)

3.7 The Environmental Impacts of the Road Construction

The existing body of literature confirmed that road construction of any rural and urban settlement will have direct or indirect impacts on the environment. However, the relevant past works done in on rural roads in relation to the study areas will be reported in this session.

Direct Impacts

Direct impacts involve the effects of the physical presence of the road since the construction requires direct utilization of land, possibly for environmental practices such as farming. Rivers and streams can be diverted during road construction. And it will probably affect the aquatic animals, wildlife populations and endangered plant species according to the U.S. Humane Society and the Urban Wildlife Research Centre (Audain, 2014).

Indirect Impacts

These impacts are more closely related to the construction process and often pose a more serious risk to the environment. They include issues such as land erosion and pollution from construction raw materials, which has knock-on effects on earth surface quality. Another one is deforestation when roads are cut into forest areas to support easy logging transport and settler migration (Audain, 2014).

However, the study reveals the evidence of the two impacts in the areas that falls to phase one construction. The villagers that hunt confirmed the loss of wildlife animals and while the farmers verify the loss of plant species. Nevertheless, the researchers witnessed the particulate matter suspended to the air on the project site during the hours of blasting the rocky points such as smoke and dust. Dust and smoke from construction activities and rock blast may prejudice the project workers and host villages to respiratory infections and ailments. Likewise, the noise from vehicles associated with construction activities and those that will ply the road may increase the noise level in the villages. Likewise, vehicles emit a variety of pollutants, including heavy metals, carbon dioxide, and carbon monoxide, all of which may have serious cumulative effects.

Different categories of wastes will typically be generated around the project area. These will include domestic/food wastes, sanitary waste and some level of oil wastes. The main hazardous materials that is likely to be stored within and around the project area include diesel fuels for powering generating sets and for running machinery and equipment to be used for the project; paints and lubricants among others. These materials need to be carefully handled because they are highly flammable.

Generally, some portions of the project location are quite vulnerable to inundation and water logging during the rainy season. Therefore, in the event that road construction activities block existing natural drainage routes, it could aggravate inundation in upstream areas and cause drying up in downstream areas, leading to negative modifications in existing hydrological regimes. Finally, an accident can occur at anytime in the course of construction activities and it could result in personal injury, property damage or loss of time. Since they are not planned, specific mitigation measures cannot be provided for incidents.

The Rock blasting exercise witnessed at Itawo village (Authors field work, 2014)

Tractor fumes and dust discharged into the air during clearing (Authors field work, 2014)

The researchers with the villagers during the focus group interaction at Itawo, Jakilegbo and Akatapa village (Authors' field work, 2014)

3. CONCLUSION

This paper has examined the problems and challenges posed in Itawo, Jakilegbo, Akatapa and Okin village and the environmental impacts of the road project from Itawo-Okin village. It highlighted the direct and indirect environmental impacts of the road construction. Likewise, it enumerates the positive and negative impacts of the road project on the residents in the study areas. Finally, suggestions were made towards the identified problems.

5.0 Recommendation

Having examined the road construction from Itawo to Okin village in Surulere Local Government, the following recommendation was formulated based on the findings.

- ✓ Since the project seems to be good in the study areas, therefore the state government in collaboration with private organizations should make an urgent provision of basic facilities and amenities such as water, electricity, motor parks, traffic signs, health center, postal agency, police post, primary and secondary schools among others.
- ✓ The house owners that fall under total/partly demolished buildings should be compensated or relocated. This should be quickly attended to so as to find a place to reside in. Also, government can build low cost housing for them since most of their buildings are not structurally sound.
- ✓ Provision of water tankers to sprinkle the road should be provided by construction contractor.
- ✓ Respiratory and hearing protection should be provided by the contractor, and work in conjunction with Environmental Officers to ensure the appropriate usage of these equipments.
- ✓ Regular maintenance of machinery should be undertaken by construction contractor.
- ✓ Provision of waste bins should be provided by the project contractor for the workers on site.
- ✓ The road project should yield some definitive results and recommendations that will help keep the road safe for motorists and protect the waterways and forests in the surrounding environment.
- ✓ Government should embark on rural development plan for the study areas and fund the implementation.
- ✓ The rural development agencies in Nigeria should be established at the local level which is very close to the grass root people.
- ✓ Government should encourage public participation and the adoption of community development strategy in the study areas.
- ✓ Village infrastructural development and maintenance board should be established in the study areas to organize and educate people.

REFERENCES

Abdulkareem, Y.A. (2014): The Roles and Impacts of transportation in Nigerian society. An internet assessed online on 18th October, 2014 @ https://www.unilorin.edu.ng/publications/abdulkareemya/the-roles-and-impacts-of-transportation-in-nigerian-society.pdf

Adeboyejo, A.T (2004): Rural development planning (unpublished lecture note for UPR 307: Rural Development Planning)

Akinbode, A. (2002): Legal and Regulatory Reforms. In Matt F.A.I., Festus Akintola; Sustainable Environmental Management in Nigeria; second ed., Ibadan; Oluben Printers.

Audain, K. (2014): The Adverse Impacts of Road Construction on the Environment. An internet accessed online on 20th October, 2014 in LIVESTRONG eHow Health website © 1999-2014, Demand Media, Inc.

Environmental Protection Agency (2008): "How nitrogen oxides affect the way we live and breathe"Archived from the original on 2008-07-16. Retrieved 2008-12-10. In Wikipedia, (2014): Road and environmental impacts on roads. An internet accessed online on 19th October, 2014 @http://en.wikipedia.org/wiki/environmental_impacts_road

Forman, R.T. and Alexander, L.E. (1998). "Roads and their major ecological effects". *Annual Review of Ecology and Systematics* 29: 207–31. doi:10.1146/annurev.ecolsys.29.1.207.

Gale Group, (2010): Rural Settlement definition of Rural Settlement in the Free Online Encyclopedia.htm. The Great Soviet Encyclopedia, 3rd edition (1970-1979) © 2010 The Gale group, Inc. An internet accessed online @<a href="http://encyclopedia2.thefreedictionary.com/Rural+settelement">Rural Settlement

Microsoft Encarta (2009): 'Road' written by Urbanik, Thomas and Redmond, W.A. in Microsoft® Encarta® 2009 [DVD].

Obabori & Bryant TL., (2009): *Statutory planning in Victoria* Federation Press, Annandale.

Ogbazi, J.U. (1995): Rural Development and Planning: Concepts and Definitions. In Introduction to Rural Development Planning textbook. Edited by Chike Mba and Ogbazi (1995); Section one: Concepts and definitions; Chapter 1, page 2-7. Published by Computer Edge, Dopemu Enugu. ISBN: 978-33526-5-2.

Okoko (2006): "Urban Transportation Planning and Modeling Published by Millennium Publishers, ISBN. 978-37465-5-3, Nigeria.

Olokesusi, F. (2000) social analysis of environmental impact assessment process in Nigeria petroleum industry . NISER, monograph series Ibadan and regional, oyo state pp. 85-110.

Philip Clarke, G., White, P.C.L. and Harris, S. (1998): "Effects of roads on badger Meles meles populations in south-west England". *Biological Conservation* (Elsevier Ltd.) 86 (2): 117–124. doi:10.1016/S0006-3207(98)00018-4.

Primack, R.B. (2004): *A Primer of Conservation Biology (3rd ed)*. Massachusetts, U.S.A.: Sinauer Associates, Inc. pp. 84–89. ISBN 0-87893-728-5.

Shyllon, Folarin (1989b): Present and Future Institutional Framework for Environmental management in Nigeria. In Shyllon, Folarin (ed.); The Law and the Environment in Nigeria, Ibadan; Vantage, Pp. 90-96

Thompson, S., J.R. Treweek, N. Veicth, D.J. Thurling (1997), The ecological component of environmental impact assessment: a critical review of British environmental statements. Journal of environmental Planning and Management 40(2), pp. 157-171.

United Nations (1992), Report of the United Nations conference on environment and

Regulations. Federal Register, vol. 43, no. 230, Nov. 29, 1978. Washington D.C.: U.S.

Westlake, D., (2014):Types of Rural Settlement. An internet accessed online @ http://www.ehow.com/list_6542168_types-rural-settlement.html

Wikipedia, (2014): Road and environmental impacts on roads. An internet accessed online on 19th October, 2014 @ http://en.wikipedia.org/wiki/road; http://en.wikipedia.org/wiki/environmental_impacts_road;