



The Impact of the North Coast Highway on Socioeconomic Status and Family Life of Residents in Bogue Village, Jamaica

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Abstract

This paper investigated the impact of the North Coast Highway development on the socio-economic well-being of residents living in Bogue Village, St. James, Jamaica. It points out the connection between the new road infrastructure development and the survey respondents' socio-economic status, while investigating the impact of the North Coast Highway on family life. Time spent with families and creation of new economic opportunities were the main indicators of family life. The paper uses questionnaires and interview questions to test the hypothesis, "The North Coast Highway will improve the quality of life of the citizens through increased economic opportunities, reduced travel time and traffic congestion resulting in more time spent with families." The study found that the majority of the survey respondents use the North Coast Highway. Two-fifths of the questionnaire respondents and just over two-thirds of the respondents interviewed reported that they spent the same amount of time with their families; one-quarter of the questionnaire and interview respondents reported that they spent more time with their families; three-tenths and one-eighth of the questionnaire and interview respondents respectively spent less time with their families after the construction of the North Coast Highway. There is greater transport mobility and connectivity with surrounding communities and Montego Bay, and hence increased access to the various economic opportunities and amenities of life.

Keywords: Highway, Socio-economic, Bogue Village, Family life, Respondents, Travel time

1. Introduction

The underlying purpose for transportation investments is to improve accessibility. Accessibility refers to the ease of movement or interaction between geographic locations (Hanson, 1995). The construction of new highways is the "quintessential public sector investment" by which government attempts to encourage economic growth in rural areas as well as in some urban areas (Chandra & Thompson, 2000). Research indicates that highways have significant outcomes for rural inhabitants, bringing economic activities and creating substantial benefits for those who live on the roadsides, compared with those living in inaccessible "off-road" regions (Porter, 2002; Wilson 2004). The construction of new highways also increases the price of agricultural land (Shi et al., 1997), thereby encouraging development. However, other studies have found that new highways reduce the traditional rural economic activities of nearby communities such as agriculture, but enhance and concentrate urban economic activities such as manufacturing and retail in the communities the highway intersects (Rephann & Isserman, 1994; Chandra & Thompson, 2000). Shifting the economic productivity from rural to urban activities promotes urbanization, at least in communities through which the highway passes, as reduced travel time encourages establishment of commerce in previously undeveloped areas. The direct impact of development of a ground-fixed transportation infrastructure such as a highway or its widening may be of two types. The direct impact is likely to be in the form of (i) the increase in traffic carrying capacity and (ii) a reduction in the cost of use of the road infrastructure. These would bring about higher transport mobility and lower travel cost (both in terms of money and time) to the people accessing the highway. An increase in the number of trips (for all purposes together) per day of a household or reduction in the average travel cost (if any) for such trips would be the immediate direct benefits of a highway project. Here, the travel cost may be interpreted as the cost of operation along the highway. The indirect impact of a highway development, on the other hand, would result from the dynamic developmental externalities generated through the forward and backward linkages (Sengupta, 2007). An example of this can be a change in the land use pattern in the areas that receive greater connectivity due to the highway, since there will be changes in the patterns of settlement, location of industries, trading and others services. All these would be reflected in the changes in the pattern of economic activities, income generation, price evolution and employment conditions prevailing in the concerned local region. A new land use pattern may in turn induce greater accessibility to job markets, health and educational facilities, etc., attract investment for the development of feeder roads, power distribution networks, telecommunication facilities and other modes of connectivity among other things leading to a greater access of the local people to markets and infrastructural facilities. All these should have a bearing on the level of well-being of the households, although some of them may not themselves necessarily use more of the highway facility created. These would in turn lead to changes in the level of well-being and human development, through their impact on consumption level, educational attainment, health status, etc. in the local economies consequent to such road development (Sengupta, 2007).

The Government of Jamaica (GoJ) through the Ministry of Transport and Works (MTW), and the National Works Agency (NWA) implemented Segment 2 (Montego Bay to Ocho Rios) of the Northern Coastal Highway Improvement Project (NCHIP) with funding assistance from the Inter-American Development Bank (IDB). The IDB approved a US\$59.5 million loan to Jamaica to improve a section of the Northern Coastal Highway in order to reduce costs and assist the development of tourism and other industries. The 92-kilometer section of the road between Montego Bay and Ocho Rios, underwent enhancements that included resurfacing, reconstruction alignment, curve flattening, and realignment. The investment was designed to allow safe traveling at 55 miles per hour in unrestricted areas and 35 miles per hour or less in townships and other restricted zones. The works was implemented in sections and these are: Section 1 - Montego Bay to Greenside (Bougate); Section 2 - Greenside to Rio Bueno; Section 3 - Rio Bueno to Salem

and Section 4 - Salem to Ocho Rios (Ministry of Transport and Works, 2003).

The construction of the North Coast Highway represents one of the largest public investments in Jamaica. It can be seen as a powerful tool for community and national development. Nearly every citizen is affected by the construction of the highway. The highway affects property owners, community-businesses, residences, and municipal facilities through or around which the highways pass. The commuting public - both through and local traffic, which includes many transportation interests is affected. The industrial and commercial interests in Montego Bay and surrounding environs which stand to gain or lose from the new transportation network are also affected. Bogue Village is one of the newly built housing schemes in the Montego Bay region in the last five years. The survey respondents in Bogue Village can be described as living in the 'influence zone' of the North Coast Highway. The community consists of professionals such as bankers, hotel administrators, customer service agents who can be considered as middle income earners and others such as cabinet makers who can be considered low income earners. Factors that distinguish the social groups in the community include the type and level of employment, income earned, and ownership of assets such as property and businesses. This has bearing on the ability to purchase and own a motor vehicle; the ability to purchase petrol which may affect the frequent use the highway; and the use of public transportation such as taxis and buses. Bogue Village is an excellent choice of all the communities that link and run parallel to the North Coast Highway, as it is a rapidly growing suburban community on the south-eastern outskirts of Montego Bay. It is one and a half miles from the city centre and it is in the 'influence zone'. The ease of access to the North Coast Highway clearly means that the residents of Bogue Village will be directly impacted. The investigation of the social, economic and environmental impacts of the road infrastructure of the North Coast Highway on this community is vital as it gives information on the residents' perspective and has implications on the quality of life of the persons who use the North Coast Highway. It also helps to test the hypothesis, "The North Coast Highway will improve the quality of life of the citizens through increased economic opportunities, reduced travel time and traffic congestion resulting in more time spent with families."

1.1 Aims and Objectives

Development of transport facilities like road infrastructure in rural or urban areas in Jamaica can play a significant role in changing the socio-economic conditions of living of the people who live in these areas through dynamic externalities that such development often generates. It can in fact be an important element of both direct and indirect interventions for poverty reduction and improvement of socio-economic conditions of the people. However, there is little assessment of the socio-economic impact of an infrastructural project like construction/widening of the North Coast Highway. Therefore, this study investigated the economic and social impact of the North Coast Highway, a major transportation route for the country's North Coast. The study of an independent variable, the highway, provides a useful lens with which to view and understand current socioeconomic perceptions and trends. These trends are presented in terms of frequency of use of the highway, its effect on family life and any economic benefits to individuals or the community. The socioeconomic and family life variables and the impacts of the new highway are assessed based on research conducted in the community of Bogue Village, which runs parallel to and in close proximity to the North Coast Highway.

2. Method

2.1 Sample

Investigative research was conducted in Bogue Village, a community located on the south-western outskirts of Montego Bay, and which runs parallel to and located in close proximity to the North Coast Highway. Bogue Village consists of 392 housing units with an approximately nine hundred residents. The Cochran's sample formula (Cochran, 1977) and Cochran's correction formula were used to calculate the final sample size. Using the statistical formula $n = t^2 s^2 / d^2$, with a selected alpha level of 0.025 in each tail and an acceptable margin of error of 0.03, the sample size was calculated as 66. The convenience sample size used in the study was 58 residents whose aged from 18 to 72 years. Random sampling was administered and the method of data collection was via personal interviews and use of questionnaires with the residents at their own homes. The sample survey conducted in February 2009 covered the community of Bogue Village. Residents under 18 years of age, or residents who were illiterate, had severe visual, hearing or learning disabilities, or major psychiatric illnesses, were excluded from the survey. Questionnaires were self-administered with trained and supervised facilitators on hand to explain any questions that were unclear. Quality auditing was performed to ensure all questionnaires were completed properly. A total of 50 questionnaires were disseminated and all of these were completed and useable, thus giving a response rate of 100 per cent. The research instrument was a 19-item questionnaire consisting of two sections. The first section collects the respondents' personal employment and household profile. These include demographic variables such as age, gender, occupational status, family type, and the number of persons in household. The second section examines the impact of the highway on the respondents. The question asked looked at how long respondents have been living in the community, use of the highway, means of transportation, and the impact of the highway on their economic status and family life. Answers reported here are the general consensuses of these surveys. Additionally there were eight face-to-face interviews of residents living in Bogue Village. The interview format covered

questions similar to those on the questionnaire. Questions covered by the interviews include:

- nature of employment,
- mode of transportation to and from work,
- distance between work and home,
- most common mode of transportation when using the highway,
- changes in transportation cost since the erection of the highway,
- time spent with family since the construction of the highway,
- benefits derived from highway construction,
- employment opportunities for oneself and one's family since the construction of the highway.

2.2 Statistical Analysis

The data was processed using Statistical Package for Social Sciences (SPSS, Chicago, IL). Results are given as percentages. Analysis of variance (ANOVA) test were employed to examine the relationship between the demographic characteristics of the residents and the impact of the North Coast Highway on their economic status and family life. A two-tailed P-value of 0.05 or less was considered to indicate statistical significance.

3. Results

3.1 Questionnaire

Of the 50 persons who completed the questionnaires, the majority were female (66%) compared to males (34%; Table 1). Most of the respondents (54%) represented the age group 26 – 40 years followed by those in the 41 – 60 age category (22%), 18 – 25 year olds (20%). Majority of the respondents were permanently employed (44%), followed by self-employed (28%), temporary employed (14%) and unemployed (14%). The nuclear family was the dominant family structure with 56%, while single-parent families accounted for 28% and extended families 14%. A total of 76% of respondents have children, with 68% of these persons reporting that their biological children live in their households. The majority of the respondents have two children (28%) followed by those with one child (22%), three children (8%) and four children (8%).

The survey findings indicate that a significant number of the respondents have been living in the community for 1 – 5 years (28%), when compared to those living over 10 years (32%), and those living less than one year (12%; Table 1). Approximately two-thirds (58%) of the respondents do not work in the community. The use of the highway by the residents of Bogue Village was high (96%), with 64% representing daily use, followed by 22%, who use it between 1 – 3 days, and 14%, 4 – 6 days. Private motor car (52%) was the most common mode of transportation when using the highway, while others use public transportation such as taxis (34%) and buses (4%). Most of the respondents (58%) believed that the cost of transportation had changed since the construction of the highway and the majority stated that this was due to increase in gas prices.

In examining the effect of the highway on families living in Bogue Village, the majority of the respondents (40%) reported that they spend the same amount of time with their family (Table 1). The remaining respondents reported that they spend more time (26%) or less time (28%). Approximately three-fifths (58%) of the respondents reported that there were benefits derived from the construction of the highway. These benefits include: better traffic flow, less time spent on the road resulting in early arrival at home, better roads, more space on the roads to drive, easier access to places of recreation, and convenience offered by the use of the highway. A significant number of respondents (80%) felt that the construction of the highway did not provide employment opportunities. Those who felt otherwise stated that persons in the community were employed during the construction of the highway.

3.2 Interview

Eight persons were interviewed, of which the majority were females (66%). Approximately two-thirds (62.5%) of the respondents have been residing in the community for four years while 12.5% has been living in the community for 3 years. The majority of the respondents have four members in their family while 25% has three members and 12.5% has 5, 2, and 1 member(s) respectively. Of the eight interviewees, two were customer service agents, while the others were: banker, cabinet maker, hotel administrator, guidance counsellor, homemaker and unemployed. The most popular mode of transportation was private motor cars used by 62.5% of interviewees while the others use public taxis (37.5%). Most of the respondents (57%) worked within three miles from home while the others worked from 3 – 18 miles away from home. Private motor car (50%) was the most common mode of transportation when using the highway followed by taxis (37.5%).

Just above one-third (37.5%) of the respondents reported that the cost of transportation had increased since the construction, while the others thought that there was no increase. In examining the effect of the highway on families

living in Bogue Village, the majority of the respondents (62.5%) interviewed reported that they spend the same amount of time with their family. The remaining respondents postulated that they spend more time (25%) or less time (12.5%). Fifty percent (50%) of the respondents stated that there were benefits derived from the construction of the highway. These benefits include easier access to roadway and arriving at home in less time, as well as less wear and tear on motor car. Many of the respondents (87.5%) felt that the construction of the highway did not provide any employment opportunities. Those who felt otherwise reported that youths in the community were employed during the construction of the highway.

4. Discussion

A major objective of the study was to examine the social impact of the North Coast Highway on the residents of Bogue Village. The mobility of the survey respondents tended to be social rather than economic in character. Transport mobility is generally characterized by visiting social facilities such as schools, clinics, markets and other basic facilities. The direct economic benefits of proximity of Bogue Village to the North Coast High Way are expected to arise mostly out of enhanced transport mobility. A household living closer to the North Coast Highway should experience greater movement for the purposes of travel for work, business, education and health and thus have a higher 'trip rate'.

Approximately one half of the survey respondents indicated positive perceptions of the North Coast Highway and felt that the new highway has made a positive difference in their lives. The most oft-cited change was the ability to travel well. This means that a person now travels with more ease as there were previously many obstacle potholes and roads in very poor conditions. Other benefits of the North Coast Highway are reduction in flooding because a proper drainage system was constructed; less wear and tear on motor vehicles; improved safety and driving conditions; more trading opportunities as it became easier for people to trade freely because more persons who are selling things from outside were coming to the area. The low and medium income groups have also benefited through trading opportunities created in the area; easier access to places of importance such as supermarkets, schools, business places; improved connectivity with surrounding communities; it became easier for residences of Bogue Village to travel and even hire taxis from Montego Bay and other communities/towns to their homes; marginal increase in the number of trips made into Montego Bay and other surrounding communities because of the improved road infrastructure; and opportunities that the North Coast Highway gave in accessing the various places in a shorter time that is, shorter traveling time. Travel time has improved especially for those residents who own private motor vehicles.

Population and economic growth spur travel demand, which, in the absence of other travel options, result in disproportionate increases in the use of motor cars. From 1980 to 2005, the United States population grew 30 percent (United States of America Census Bureau) while the number of registered motor vehicles increased 60 percent and the number of vehicle miles traveled grew 95 percent (Highway Statistics Series). Chronic under-investment in public transportation and lack of travel alternatives reinforce private vehicle use. Despite recent expansion in public transportation services and resulting record increases in some urban areas, relatively few Jamaicans have access to reasonable or attractive transit options. In Jamaica, the number of private motor cars in the last decade has been steadily increasing and the mobility patterns of individuals do, to some extent, depend on the availability of finances. Income is a big determinant of where one travels to and the mode of transport one uses to get to their destination. The most common means of transport of the survey respondents (both questionnaires and interviews) in Bogue Village was the use of private motor vehicles. Motorized transport is the most convenient and desirable mode of transport in Bogue Village as it makes mobility easier, especially because most of the essential services (supermarket, schools, clinics and hospitals) are located in Montego Bay.

The ability for a region to import and export depends upon the accessibility to that area. Poor roads or a lack of roads greatly hinder the economy. A well constructed highway reduces transportation costs, which allows companies to produce goods at lower costs, increase profits, expand business, hire more workers and generate more income/employment growth in the local economy (Rephann & Isserman, 1995). From this example, one could argue that job growth and development is one of the most powerful methods for the government to increase socio-economic status in a region. Approximately one-fifth of the questionnaire and one-eighth of the interview respondents reported that the North Coast Highway did not provide any economic opportunities for residents of the community. The only source of employment was the actual construction of the highway. The improved road infrastructure as a result of the North Coast Highway could benefit the operations of the newly constructed hotels in Montego Bay and possibly provide employment for some of the residents of Bogue Village.

The family is the basic unit of society and plays a key role in social development. In Jamaica, family life is characterized by: an underlying concept that defines family in terms of "blood" rather than residence or domestic economy (Chevannes, 2000). A large number of female-headed households (44%) exist in which visiting unions and common law relationships are relatively more common than marriage. The extended family is prevalent in Jamaica and the majority of Jamaicans grow up in households comprising some form of extended family members – mostly with mother, grandmother, aunts and cousins (Brown et al., 1993). A larger number of children and elderly members live in

female-headed households. There is a large proportion of children (19%) living with neither of their biological parents – especially children from low-income families (McDonald-Levy, 1998). In the context of this study, the North Coast Highway will have a direct impact on the families (nuclear, single-parent or extended) that reside in communities in close proximity.

In this study, one of the indicators of assessing the impact of the North Coast Highway on family life is the time that the survey respondents spend with their families. Over the past two decades, social norms and expectations have changed, prompting parents to make “greater investments in child-rearing.” Many parents feel they need to keep a closer eye on their children because of concerns about crime, school violence, child abduction and abuse. Published research concludes that fathers and mothers in the United States of America spend at least as many hours caring for their children each week as parents did four decades ago (Bianchi et al., 2006). On average, employed mothers get somewhat less sleep and watch less television than mothers who are unemployed, and they also spend less time with their husbands (Bianchi et al., 2006). With the economic hardship in Jamaica, both mothers and fathers are involved in earning a living which involves traveling to and from work. Financial stress can alter parenting practices by decreasing the time available to spend with children (McLanahan & Sandefur, 1994).

In this study, two-fifths of the questionnaire respondents and just over two-thirds of the respondents interviewed reported that they spend the same amount of time with their families since the construction of the North Coast Highway. One-quarter of the questionnaire and interview respondents reported that they spent more time with their families since the construction of the North Coast Highway. It is possible that these respondents work at home, in the community or within two miles of the community. Approximately three-tenths and one-eighth of the questionnaire and interview respondents respectively spent less time with their families. The survey respondents who spend less time with their families reported that they worked more than two miles away from home and usually spend longer time in traffic in peak hours due to traffic congestion, so they arrive home later than before the construction of the North Coast Highway.

Traffic congestion is a result of too many vehicles crowding available road space along with a lack of alternative travel options. The economic value of time lost to traffic congestion is enormous, but the consequences for family life may be more significant. Parents arriving home from a hard day’s work followed by an exhausting and infuriating struggle in traffic are hardly in the right frame of mind to enjoy the little time that they have with their children. Congestion wastes time and affects peoples’ quality of life. Time spent in traffic is time that cannot be spent working or with families.

In the study, most of the respondents who reported that they spent less time with their family due to traffic congestion on the North Coast Highway were those who worked more than two miles from home. The traffic congestion on the highway could be due to increased use by motorists who are taking advantage of the improved or new road infrastructure, and/or unexpected events. The volume of motor vehicles on these routes has significantly increased. Among the external costs believed to be associated with traffic congestion are the human stress effects. The uses of private automobiles as well as the inefficient public transportation system and constrained by the availability of housing, workers endure congested commutes and absorb the stressful consequences. The stressful effects of chronic exposure to traffic congestion and other demands of long-distance driving in commuting between home and work has been demonstrated in a series of studies (Novaco, 1992; Novaco et al., 1991). In these studies, traffic congestion has been understood to be stressful by virtue of its impedance properties. That is, it operates as a behavioural constraint on movement and goal attainment, thus constituting an aversive, frustrating condition. As such, it elevates physiological arousal, elicits negative emotional states, and impairs cognitive performance. Other studies have found that high impedance commuting indexed by objective and subjective dimensions, have adverse effects on blood pressure, mood, frustration tolerance, illness occasions, work absences, job stability, and overall life satisfaction (Novaco & Collier, 1994). In addition, dissatisfaction with daily commuting has been found to produce undesirable psychological and psychological responses, including increased negative mood states, increased irritability, and more impatient driving behaviour (Novaco & Collier, 1994). Congestion also reduces access to jobs and other activities, and causes people to rearrange schedules or even change their residence location. Travelers driving in congestion experience increased levels of stress and aggression, especially if they are late or the congestion is unpredictable. Therefore, congestion negatively affects family life as found in this study.

A wide range of effective strategies are available to address congestion. These are not limited to traditional capacity expansion and bottleneck removal projects. System operational improvements such as traffic signal timing can cost-effectively improve traffic flow. Incident management and traveler information programs can reduce delays due to unexpected congestion (Cox et al., 2007). The economic and social impact data gathered in this study will serve as a benchmark for future studies of the improved road infrastructure of the North Coast Highway. The importance of this study comes from two different perspectives. First, there is little scholarly literature regarding the social and economic impact of highways in the Caribbean on residences in communities in close approximation to the highway. Secondly, this study can form the basis on which further studies can be done which could contribute to policy issues concerning the use of the highway, the socio-economic of the North Coast Highway on families that uses and live in close

proximity, and the monitoring of highway maintenance.

The methodology used in this study involves both questionnaires and interview questions. The use of another method such as a focused group may have provides more useful results. Future studies could be done in communities in a much larger geographic area with a larger representative sample of respondents. The questionnaires could be more improve with more specific questions about family life, looking at key quality indicators of family life. These could include: do you spend more time with your wife/children? Does the highway allow you to participate in more leisure activities with you families in the evenings after work or on weekends? Since there is reduced travel times using the highway does it afford you more time at these social facilities with your family? Do you spend more time with your children bonding or assisting with homework? In addition there could have been psychological questions that deal with how the respondents who spend less time with their families felt and whether there was the evidence of increases irritability and mood swings etc. Additional questions could focus on any change in the nature of the relationship of the respondents with family members after the construction of the highway.

5. Conclusion

This study used questionnaire and interview question to test the hypothesis, "The North Coast Highway will improve the quality of life of the citizens through increased economical opportunities, reduced travel time and traffic congestion resulting in more time spend with families." The study found that the majority of the survey respondents use the North Coast Highway. Two-fifths of the questionnaire respondents and just over two-thirds of the respondents interviewed reported that they spend the same amount of time with their families; one-quarter of the questionnaire and interview respondents reported that they spend more time with their families; three-tenths and one-eighth of the questionnaire and interview respondents respectively spend less time with their families since the construction of the North Coast Highway. There is greater transport mobility and connectivity with surrounding communities and Montego Bay, and hence access to the various economic opportunities and amenities of life. Respondents that spend less time with their families cited traffic congestion during peak hours as a main cause for arriving home later from work in the evenings. Regardless of whether congestion is recurring (traffic regularly exceeds roadway capacity) or on-recurring (predictable and unpredictable events cause delays), there is one root cause of congestion, that is there are too many vehicles crowding available road space, coupled with a lack of travel options. There was minimal direct employment opportunities created due to the construction of the North Coast Highway, however indirect impact could be employment in the tourism industry due the construction of the new hotels in Montego Bay, which has improved road infrastructure. The results presented in this study has support the view that a large public sector investment project on road infrastructure development can improve to some extent the socio-economic well-being of the citizens that lives in communities in close proximity to the highway, especially in the area of employment and particularly, residents of Bogue Village, St James.

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Table 1. Demographics, social and economic variables of respondents in the study

Variables	No.	%	P value
Gender			
Male	33	66	0.001
Female	17	34	
Age group			
18 - 25	10	20	0.05
26 - 40	27	54	
41 - 60	11	22	
> 60	2	4	
Employment status			
Permanent	22	44	0.05
Temporary	7	14	
Self-employed	14	28	
Unemployed	7	14	
Family type			
Nuclear	29	58	0.001
Single	14	28	
Extended	7	14	
Number of Children			

0	9	18	0.08
1	11	22	
2	14	28	
3	4	8	
4	4	8	
>4	8	16	
Years of living in the community			
< 1	6	12	0.05
1- 5	14	28	
6 - 9	8	16	
> 10	16	32	
Mode of transportation			
Private motor car	26	52	0.001
Taxi	17	34	
Bus	2	4	
Other	4	8	
Frequency of use of highway			
Daily use	32	64	0.05
1 - 3 days	11	22	
4 - 6 days	7	14	
Time spend with family			
More	13	26	0.05
Less	14	28	
Same	20	40	
