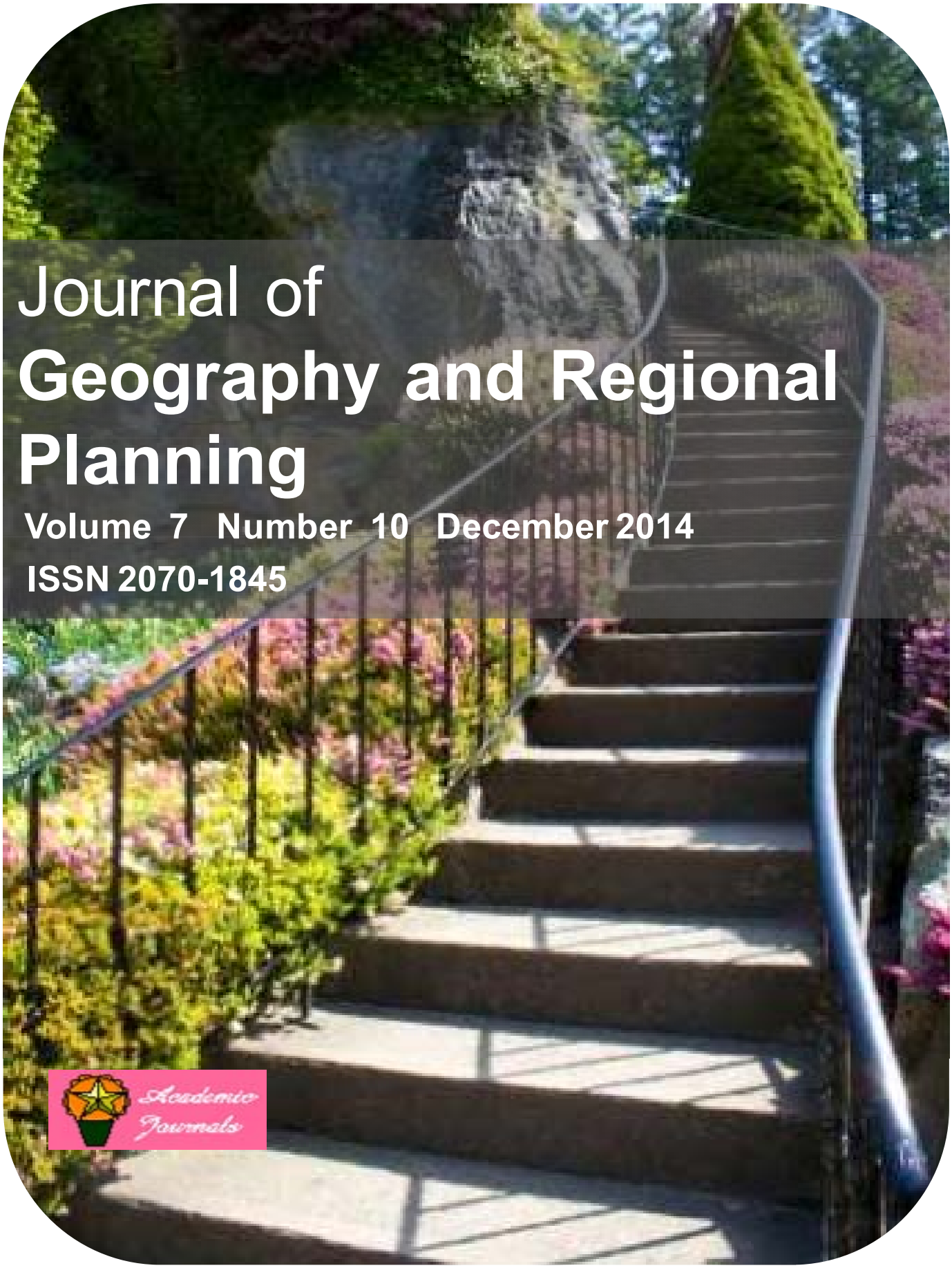

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Full Length Research Paper

The influence of highway Mexicali - San Felipe in the quality of life of their environs

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This study argues that the modernization of the Federal Highway No. 5 Mexicali - San Felipe has impacted over social benefits of 10 localities. Despite that the works have not been concluded in all the extension of the highway, the Urban Marginal Indexes are estimated at their ex – before (2000) and ex – post (2010). It is observed that the 2 localities connected directly with the road have decreased their marginalized situation considerably, as well as the other 5 localities interconnected through the secondary network. The remaining 3 have not been benefited due of their poor accessibility within the secondary network. It can be concluded that accessibility is the key factor that improves their socioeconomic conditions over time.

Key words: Urban marginal index, road infrastructure, evaluation ex - before and ex - post, localities, basic geostatistical area.

INTRODUCTION

Within any community, state or country, roads infrastructure represents a key factor for the economic and social development of its population due to the amount of merchandise and people mobilized through it (Vassallo et al., 2010).

According to the Ministry of Communications and Transportation of Mexico, in this country 96% of passengers and around 55% of freight transport use roads and highways (SCT, 2013). Therefore, a single road could be substantial to the execution of multiple productive activities from the diverse communities interconnected and benefit by it.

Federal Highway No.5 covers a 190 kilometers rout from Mexicali City, capital of the metropolitan area with the same name, to the locality of San Felipe which is found at the south of the county. The rest of the metropolitan area is constituted by 15 localities, most of them located in the agricultural valley known as Valle de Mexicali (INEGI, 2005b). This valley is a suburban and rural zone, located at the southeastern periphery of the metropolitan area; it has a high level of marginalization due to the lack of infrastructure and services such as water supply or sewage collection and disposal systems (CONAPO, 2012). For this research were considered the ten localities with the bigger number of inhabitants, a better access from the highway axis and the larger territorial dimensions.

The road infrastructure contributes to the development of educational, cultural and health services (Romero, 2001), which are essential for a person's basic development (Obregón, 2008). The Mexicali – San Felipe highway was modernized as a part of the main proposes

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in the National's Infrastructure Plan 2007-2012 during Felipe Calderon Hinojosa's presidential period, in which were prioritized construction and modernization projects with enough economic, financial and social profitability. The Mexicali – San Felipe section initiated the modernization process in 2006, assisting the communication needs between cities, ports, borders and touristic centers with high specification highways (SCT, 2011). The management procedure of the Mexicali – San Felipe project was done by the State and Federal Government to consolidate the North-South axis. This axis goes from Mexicali city, over the Golf of California's littoral, passing through San Felipe and Puertecitos, and ends at the Transpeninsular Highway (Federal Highway No.1).

The majority of the economic activities from the secondary and the third sector can be located at Mexicali City; however the valley presents a significant agglomeration of agricultural production that gradually has been decreasing if compared to the rest of the activities developed in the metropolitan area (Zavala, 2006). The economic growth associated with agricultural production during the fifties and sixties changed during the seventies; during this period the economic growth was more associated to industrialization and services that continue being provided until today (García et al., 2011).

The present research shows how, during the partial modernization of the Federal Highway No. 5 Mexicali – San Felipe, was possible to improve the economic and social conditions of the population from 7 of the 10 localities with the higher amount of inhabitants and territorial area. To achieve this, the Urban Marginal Index was estimated ex – before (2000) and ex – post (2010) during the execution of the modernization process, according to the methodological logic used to guide investment decisions in the Ministry of Communications and Transportation (Secretaría de Comunicaciones y Transportes, SCT), in relation to what is established in the Federal Expenditure Budget (Presupuesto de Egresos Federales, PEF).

In addition, the second section will present the economic and social characteristics of the impacted area, followed by a review of literature about highways investments and its evaluation aspects. Therefore, an analysis methodology is used to generate the ex – before and ex – post evaluation results from the highway modernization project, achieving this through the Urban Marginal Index estimated for each locality at the minimal level of analysis. Finally, the conclusions show a debate and reflect about the impact caused by the partial growth of the highway in discussion and the welfare of the benefited communities.

Background

Mexicali County is the capital of Baja California, with a surface of 14 541 km^2; it shares the border with Imperial Valley County, county located in California, United States in Figure 1. Its main locality, carrying the same name, is head of a metropolitan area integrated by another 14 localities, from which only 10 require access through the Federal Highway No. 5 in Table 1. Population in this localities changed from 593 840 in 2000 to 774 957 in 2010 (INEGI, 2000; 2010).

The 10 localities geographic location, in relation to the Federal Highway No. 5, allows the establishment of three accessibility scenarios about the highway's layout. Localities 1 and 3 are directly associated to the highway; localities 4, 5 and 6 are connected to the highway by a feeder road; and localities 2, 7, 8, 9, 10 are indirectly communicated with the highway through a secondary network. On its part, Federal Highway No. 5 Mexicali – San Felipe is integrated by three different subsections, the first one from the km 0+000 to km 38+000 (Mexicali – Algodones access), the second one from km 38+700 to km 170+400 (El Faro-El Chinero) and the third one from km 175+000 to km 190+000 (El Chinero – San Felipe) (Figure 1).

This area has a big influence over the touristic, agricultural, fishing, mining, commercial, services, and industrial sectors from Mexicali to San Felipe. The route from kilometer 0+000 to 38+700 has accesses to Mexicali's Valley. These accesses promote and facilitate economic activities in the suburban areas of the Valley. In "El Faro – El Chinero" section the Compañía San Felipe S.A. de C.V. is established, a mining company responsible for being the main source of employment in the area; meanwhile the "El Chinero – San Felipe" section is responsible for the development of tourism, fishing and commercial services (SCT, 2008a). This highway is one of the State's axes with the potential to boost the touristic development and it is subject to modernization with the aim of improving accessibility and safety for users.

Mexicali's county shows a diverse range of benefited activities, directly and indirectly, by the highway (Table 2). The retail trade business is the main activity with 8 594 units followed by temporary accommodation and food supply services with 2 426 units and manufacturing industry with 1 797 units (INEGI, 2012).

MATERIALS

The first Urban Marginal Index (UMI) calculus made in Mexico was in 1990 for each federal entity and county (CONAPO, 2012). Its goal was to recognize the deficiencies in goods and services, as well as the quality of life from certain territories. The UMI is used to design public policies and programs, specifically to prevent and compensate the impacts caused by urban expansion processes over the public services planning (infrastructure, education, public and health services)(Ibidem).

Roads infrastructure evaluation takes into consideration diverse socioeconomic, environmental and technical studies based on an analysis methodology which allows one to understand its relevance from different points of view, whether it is social, administrative or legal; and from different scales (local, regional, national and international) (SCT, 2011). This factors are included in the cost-

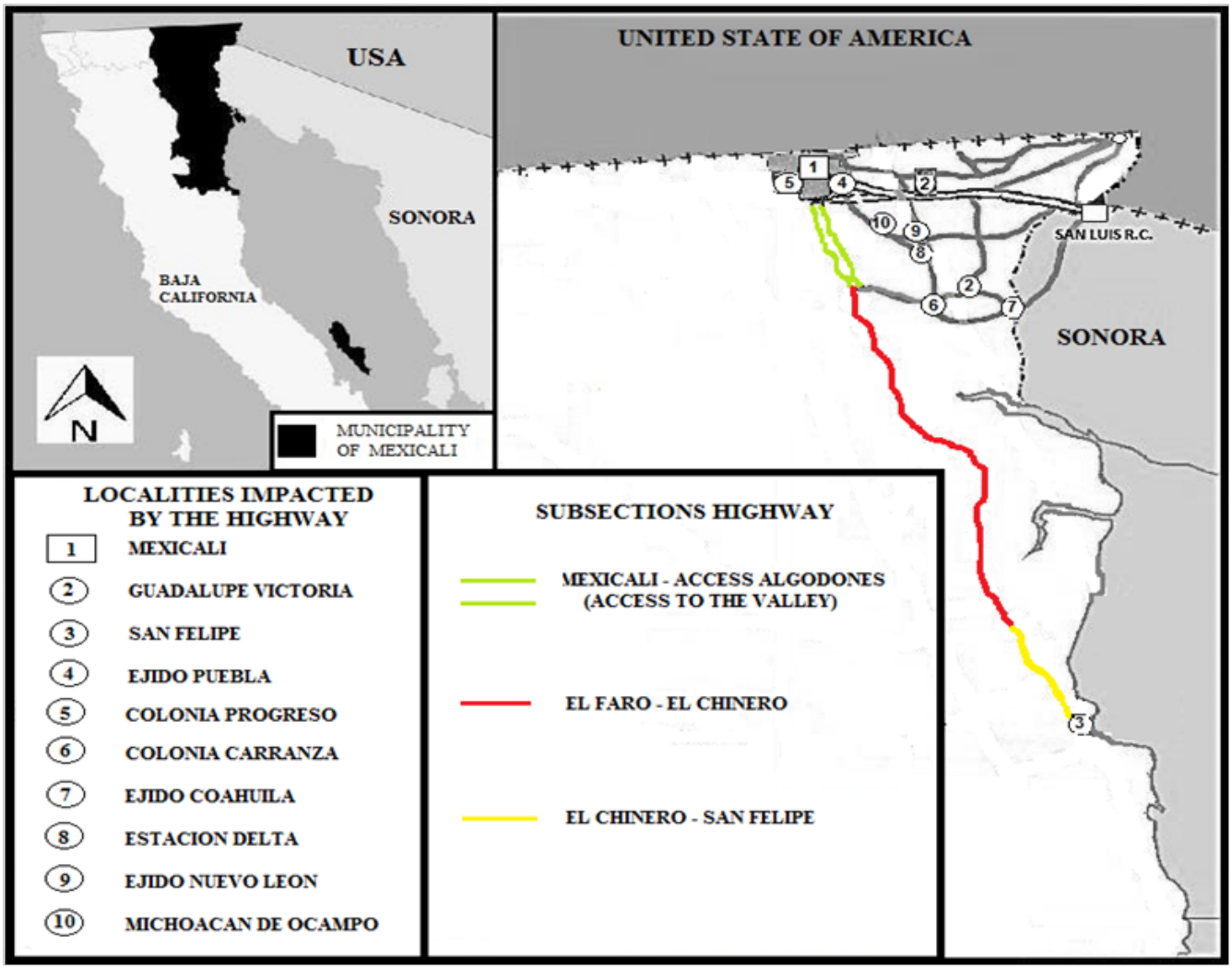

Figure 1. Location of Mexicali and localities impacted by highway stretch Mexicali Felipe.

Table 1. Main localities impacted by the Federal Highway No. 5 Mexicali – San Felipe.

Localities	Population 2000	Population 2005	Population 2010
1. Mexicali	549,873	653,046	689,775
2. Guadalupe Victoria	15,561	14,861	17,119
3. San Felipe	13,123	14,831	16,702
4. Ejido Puebla	7,421	7,014	15,168
5. Progreso	4462	5,071	12,557
6. Carranza	3,552	5,901	6,098
7. Ciudad Coahuila	6,479	5,333	5,617
8. Delta	4860	5,278	5,180
9. Nuevo León	3,255	3,255	3,655
10. Michoacán de Ocampo	3,237	3,065	3,086
Total	593,840	717,655	774,957

Source: Prepared by the author based on data from the General Population and Housing Census 2000 and 2010 (INEGI) and Population and Housing Census 2005a (INEGI).

Table 2. BGAs in relation to Federal Highway No. 5 Mexicali – San Felipe.

BGAs						
Estación	San Felipe	7798	7177	6821	7020	7603
Delta	5895	7374	7162	6268	5842	7656
6713	5912	736ª	6836	2975	3189	7779
5081	6446	5700	6291	5363	3174	7355
6709	5734	5715	5344	5819	316ª	7567
7834	4030	394ª	5486	7849	3155	6592
5109	5397	Nuevo	3070	6253	4967	7035
5077	526ª	León	5611	5378	679ª	6499
5096	5255	6431	6319	3102	3954	4064
Ciudad	3032	5452	309ª	2602	4168	
Coahuila	3047	5448	3085	Mexicali	3140	
572ª	5240	7209	6287	3827	7069	
5185	540ª	Carranza	5359	7745	3812	
519ª	3028	2706	3070	3225	5857	
2941	5908	2710	Guadalupe	5490	6588	
3973	5274	2585	Victoria	5310	4933	
2937	5414	5039	4098	5804	6658	
Michoacán	Puebla	5043	2960	3935	4168	
de Ocampo	7783	Progreso	3121	5838	704ª	
5306	3329	7181	3117	6520	7054	

Source: Prepared by the author with information from General Population and Housing Census 2000 and 2010, INEGI

benefit analysis and the road feasibility studies with an ex - before and ex – post perspective, taking into consideration scenarios before, during and after the project execution.

Ex-before projects evaluations are carried out in order to reduce the risk of the final decision. These evaluations allow one to visualize, in advance, the costs and benefits to estimate profitability indicators (MDS, 2013). Although projects of a social nature have been evaluated under ex-post criteria, nowadays they are evaluated with the ex-before criteria (SCT, 2008b).

Public administrations facilitate the cost-benefit analysis implementation as an appropriate tool for socioeconomic evaluation of road infrastructure investments. Even though this type of evaluation analysis has limitations, it tends to be very useful for decision-makers in the field (Barrios et al., 1997)

The ex-post evaluation is performed in order to check the effectiveness of the evaluation based on the experience, real values of the works, the immediate recognition of errors occurrence and the results effective disposal, regardless of the type. The analysis situations to be addressed are with and without project (MDS, 2013). This ex-post evaluation seeks to optimize the project operational efficiency and to estimate the changes that have occurred in the benefited population.This to evaluate the achievement level of the objectives set at the beginning. The difference between this two methods is focused on the benefits. The ex-before benefits occur in the future and the ex-post benefits occur during the course of the project (SCT, 2008b).

Building and modernize infrastructure is essential for any country's public policies. Therefore it should be considered and evaluated if the investments, to which public funds will be destined, will generate economic profitability (Romero, 2001).

In recent years, a large number of developed countries have chosen good governance practices in terms of investments in transport infrastructure, based on ex-before and ex-post evaluations, and the inclusion of economic – financial plans (Bel, 2009). The main conclusion is that the effects (economic activities, highway's operational conditions, etc.) and the development inducted by the highway's infrastructure bring solid benefits to the territory.

Investing in the quality of highway infrastructure is essential for the roads that cross a territory, their construction and maintenance. These roads require a great financial and technological investment as well as a vast institutional and management capacity, since it stimulates the emergence and development of sectors such as the industrial, commercial, services, agriculture, among others; it encourages economic growth (Vassallo et al., 2010).

Population distribution is influenced by highways; the same happens with economic activities (Nogués et al., 2007). Due to its impact in transportation costs, accessibility is a significant factor. It facilitates the mobility of people and goods including those derived from the construction process, and as a result accessibility grants competitiveness to countries and regions (Papí et al., 2007).

Even though investments in road infrastructure do not stimulate on their own the local or regional development, the accessibility of a territory is vital and roads are the generating factor of such effect in rural and peripheral areas sparsely equipped with infrastructure (Nogués et al., 2007; Tarr et al., 1988).

The development of a territory is reason enough to justify a road construction project (SFP, 2011), since road networks develop an integrated roads system which adapts to the resulting effects from the space-temporality relations, choice of destinations, node selection, users accessibility, speed adaptation, etc., according to infrastructure changes that occur over time (Obregón, 2008; Dupuy, 1988).

METHODS

The Urban Marginal Index (UMI) is used to assess changes in the

Table 3. Useful indicators for estimating the urban marginal index and details of dimensions.

Dimension	Indicator
Education	% population without education and/or with incomplete primary education
Health	% population without right to have health services
Housing	% inhabited private homes with dirt floors
	% inhabited private homes without electricity
	% inhabited private homes without water supply
	% inhabited private homes without drainage system

Source: Prepared by the author based on data from the General Population and Housing Census 2010, INEGI.

quality of life due to the effects that the implementation of highway infrastructure has over it. To do so is used the ex-before and ex-post methodological context (SCT, 2008b), where the ex-before evaluation (before the project) primarily addresses the cost-benefit analysis, which measures the profitability of the project comparing the costs that may arise against the profits.

The ex-post evaluation (during and after project implementation) is better to assess projects with high social applications since it analyses their functionality, identifies trends or changes of the affected population and it determines the degree of efficiency achieved according to the desired objectives. This type of assessment allows one to evaluate the impact on the population even during the execution of the project, as in this case. In projects where the main goal is to measure the improvement in marginalization levels, the UMI is used as a goals inspector monitoring the success of each one of them and it allows the prioritization of study units for a subsequent territorial stratification. Furthermore this complies with a number of characteristics which demonstrate the homogeneity or heterogeneity, between the territorial divisions, by the minimum variance criteria (Bistrain, 2010). For this purpose, as a study unit the Basic Geostatistical Areas (BGA) are used which take into consideration urban and rural areas. This division is one of the 3 main territorial divisions based on the National Geostatistical Framework from the National Institute of Statistics and Geography better known as INEGI (CONAPO, 2012). The other two divisions are the Geostatistical State Area (GSA) and the Geostatistical Municipal Area (GMA).

As a part of the ex-before and ex-post evaluations, Urban Marginal Indexes were estimated in two periods, for BGA urban areas selected from Mexicali's localities: the year 2000 as the ex-before and the year 2010 as the ex-post, taking as reference the modernization works from the Federal Highway No. 5 Mexicali – San Felipe, but only those registered at the Mexican Secretariat of Finance and Public Credit between 2006 and 2011 (SCT, 2008a) (Table 2).

As a consequence, the analysis of the ex-post situation considers the work accomplished during the execution until 2010 because in 2013 the work was not completed yet. For this purpose, the dimensions and socioeconomic indicators elected to estimate the UMI permit to measure the improvement in the quality of life of the benefited population in their respective areas, through the access to basic education, health and housing services (Table 3).

In order to determinate the UMI of the considered BGAs the marginalization level will be considered as medium high if the indicator value is between the average and one standard deviation, as high if it is between the average and two standard deviations and as very high if it is above two standard deviations. On the contrary the BGAs will have a medium low marginal level if the indicator value is between the average and minus one standard deviation, low if it is between the average and minus two standard deviations and very low if it is between the average and minus three standard deviations (Figure 2). For this purpose the Statistical Package for Social Science (SPSS) version 19.0 was used, the obtained results allow one to classify the urban marginalization level.

To obtain the index in the years 2000 and 2010, was considered data related to the educational situation: 1) 15+ years old inhabitants without education and/or with incomplete primary education; access to health services: 2) population without right to have health services; and housing situation: 3) housing with dirt floors, 4) housing without electricity, 5) housing without drainage system and 6) housing without water supply. The indicators selection was made estimating their improvement due to the highway modernization.

To calculate the UMI by the BGAs a procedure, that allows the weighted sum of each one of the indicators involved, was used (CONAPO, 2004):

$$IM_i = \sum_{j=1}^{6} a_j Z_{ij}$$

IMi= Urban Marginal Index used by BGA
J = Shows each one of the indicators (j = 1,…6).
aj= weight assigned to each marginalization indicator j (extracted from principal components matrix in SPSS)
Zij= standardized value of each marginalization indicator j, whose percentage is subtracted from the average value and y the difference is divided by the standard deviation from each socioeconomic indicator.]

Once obtained the summation of each socioeconomic indicator in its respective BGAs the marginalization level can be determined from the normal distribution in Figure 2.

RESULTS

A first result is a phenomenon of population concentration, where the areas with lower UMI tend to be close to the capital in the first subsection. However, at the southern end of the highway is San Felipe concentrating population associated with mining development, which has been consolidated due to the facility provided by the road infrastructure of the second subsection; and the population associated with tourism development generated by the third subsection, although part of this population is floating because they remain just one season of the year.

At the ex-before level, the BGAs' UMI from the localities affected by the highway modernization, in 2000 a 5%

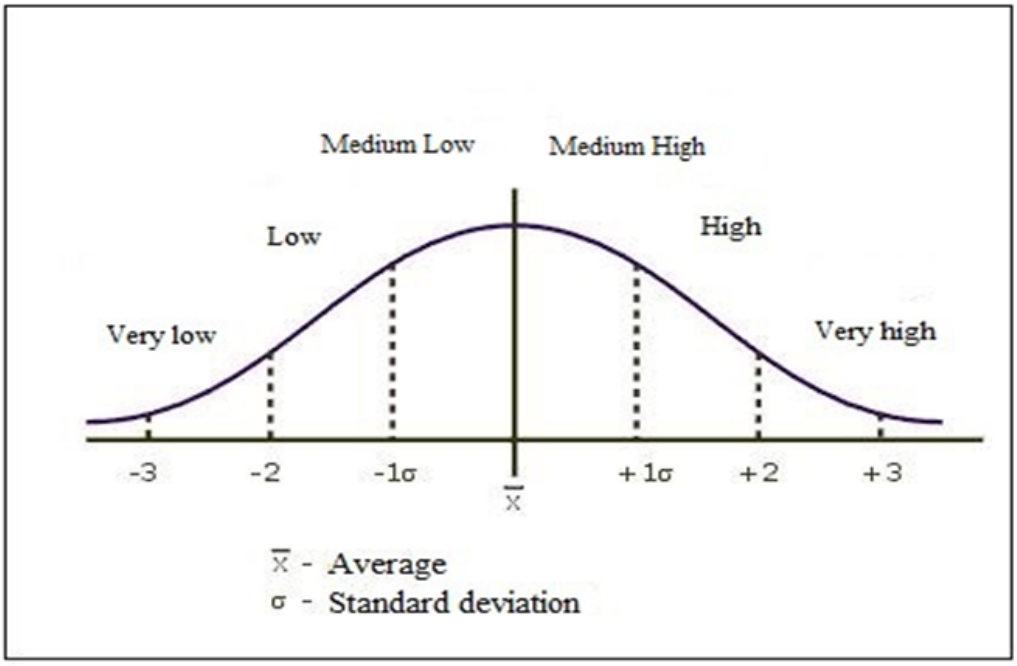

Figure 2. Marginalization level description with reference to a normal distribution.

of them were in a Very High situation, a 25% had a High level, a 45% were in a Medium High level and a 25% in a Medium Low level (Figure 3).

In that year the characteristics of the road allowed a maximum speed of 80 kilometers per hour in much of its route, with a service level between bad and regular due to the physical condition of the bearing surface and the small roadway dimensions of its subsections, mainly in the last two subsections. And although the traffic flow was stable due to the aforementioned reason, there was a high risk of accidents given the vehicular composition of cars, buses and cargo transport, but particularly in speed limits because they were not suitable for heavy vehicles such as trucks, trailers and motorhomes (RVs).

At an ex-post evaluation level, for tracking purposes the criteria was reaffirmed, the priority was not to attend traffic congestion problems associated with the Annual Average Daily Traffic (AADT). In fact, between 2002 and 2007, the AADT went from 2 910 to 7 357 vehicles per day. Furthermore in 2006 a study about the accidents of this road was made, estimating nearly 3.8 million pesos in damages, where the main causes were excessive speed, invasion of oncoming traffic lane and inadequate passing choices (SCT, 2006).

Although modernization of the highway was not fully completed, in 2010 its safety and accessibility were increased, allowing it to have a higher service level, considered as good, due to the pavement design for maximum speeds between 105 and 110 km/hr, and wider highway.

The UMI of the BGAs from localities affected by the highway in 2010 shows a 3% of BGAs with Very High levels, 9% with High, 44% in a Medium High level, a 39% in a Medium Low and the 5% in a Low situation (Figure 4).

When the two stages of evaluation are compared, in Mexicali City a reduction in the level of marginalization is perceived. Medium Low levels (previously in a Medium High level), increased from 50 to 60% and a relevant aspect was the emergence of Low levels of urban marginalization in 2010.

At the Colonia Progreso area a positive change can be appreciated: in 2000 there was a 50% of BGAs with High urban marginalization, in 2010 a 35% were in a Medium Low level and 50% in Medium High level; at the Delta Station in 2000 a 100% had a Medium High urban marginalization level and in 2010 a 25% was in a Medium Low level.

In San Felipe marginal level decreased in most of the BGAs going from a 50% in a Medium High and a 25% in High level, to less than 50% between the Medium Low and Low marginalization levels.

In 2000 at Ejido Puebla the BGAs presented a 75% of areas with Medium High marginal levels, afterwards in 2010 a positive change occurred with 50% of marginalization on a Medium Low level; Colonia Carranza had 80% of Medium High marginalization and 20% of High marginalization in 2000, and it changed to 50% at Medium Low levels in 2010; Guadalupe Victoria changed from 40% of Medium High marginalization and 40% between High and Very High in 2000, to have more than a 65% of Medium High levels and 25% between Medium Low and Low levels in 2010.

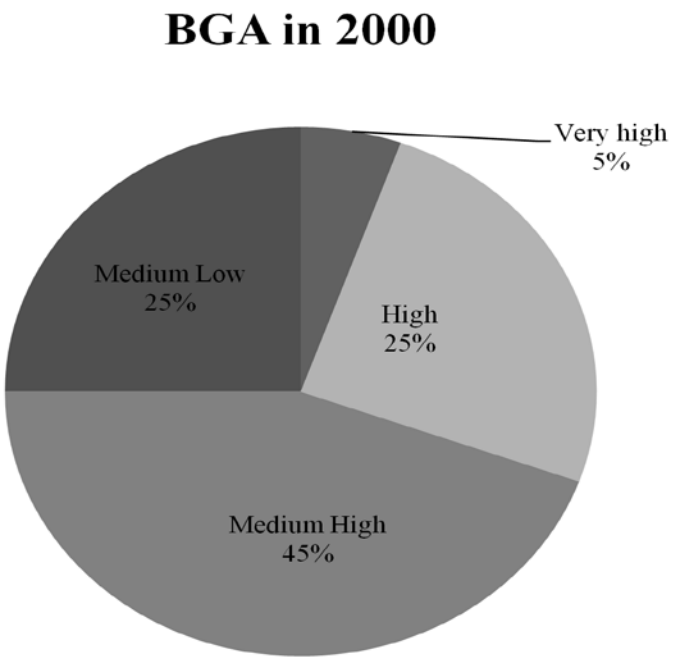

Figure 3. UMI in BGAs affected by highway stretch Mexicali San Felipe in 2000.

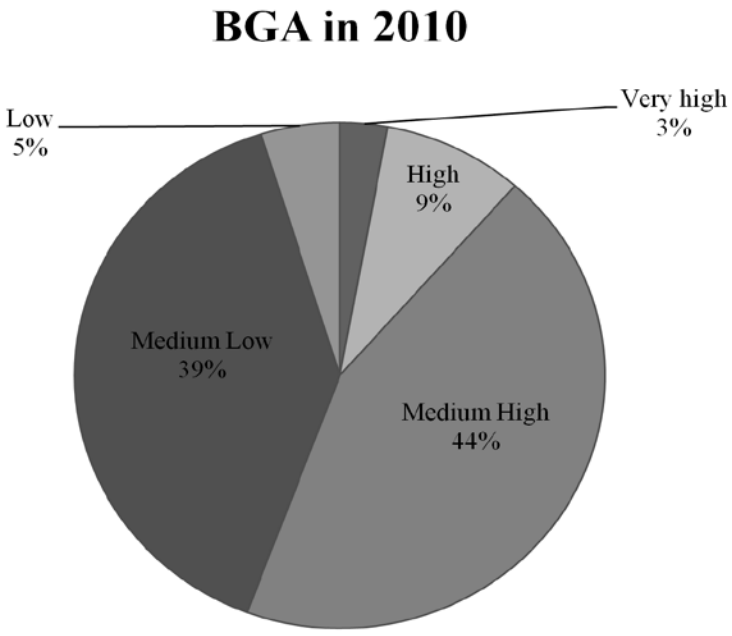

Figure 4. UMI in BGAs affected by the road stretch Mexicali San Felipe in 2010.

Ejido Nuevo León and Michoacán de Ocampo did not present changes, during both years the Medium High marginalization levels were maintained, although the first presented an increase of more than 50% of BGAs. Finally, Ejido Coahuila was the only one showing negative changes in 2010 (Table 4).

Table 4. Marginal index per basic geostatistical area between 2000 and 2010.

Marginal index per basic geostatistical area					
2000			2010		
BGA	**(%)**	**Level**	**BGA**	**(%)**	**Level**
Mexicali			**Mexicali**		
3827	2.0850981	Medium High	3827	-3.807695	Low
			7745	-3.113079	Low
3225	-2.040825	Medium Low	3225	-2.974704	Medium Low
5490	-1.382423	Medium Low	5490	-2.954719	Medium Low
5310	-1.342607	Medium Low	5310	-2.791016	Medium Low
5804	-0.846978	Medium Low	5804	-2.742442	Medium Low
3935	-0.534668	Medium Low	3935	-2.448999	Medium Low
5838	4.8298448	High	5838	-2.448299	Medium Low
			6520	-2.407259	Medium Low
			7020	-2.142916	Medium Low
5842	1.0667229	Medium High	5842	-2.114601	Medium Low
3189	-0.146555	Medium Low	3189	-2.022181	Medium Low
3174	-0.10152	Medium Low	3174	-1.934768	Medium Low
316[a]	0.25077	Medium High	316[a]	-1.87662	Medium Low
3155	0.7295224	Medium High	3155	-1.847086	Medium Low
3140	1.158898	Medium High	3140	-1.84232	Medium Low
			7069	-1.661629	Medium Low
3812	3.031076	Medium High	3812	-1.654999	Medium Low
5857	5.2853911	High	5857	-1.639018	Medium Low
			6588	-1.574961	Medium Low
4933	1.1610195	Medium High	4933	-1.089851	Medium Low
			6658	-0.61928	Medium Low
			4168	-0.443929	Medium Low
			704[a]	-0.303816	Medium High
			7054	0.1146649	Medium High
			7603	0.2156831	Medium High
			7656	0.3207171	Medium High
			7779	0.3339001	Medium High
			7355	0.4676332	Medium High
			7567	0.660631	Medium High
			6592	0.7208291	Medium High
			7035	1.0928265	Medium High
			6499	1.4639982	Medium High
4967	-0.190947	Medium Low	4967	1.5611497	Medium High
			679[a]	3.7000898	High
3954	-2.252791	Medium Low			
4168	-0.481128	Medium Low			
4064	3.3293804	High			
Estación Delta			**Estación Delta**		
			6713	-3.120314	Low
5081	0.7096779	Medium High	5081	-0.762986	Medium Low
			6709	0.0388949	Medium High
			7834	0.7818269	Medium High
5109	2.0426038	Medium High	5109	1.5248706	Medium High
5077	1.3525615	Medium High			
5096	0.0852729	Medium High			

Table 4. Continued…

Marginal index per basic geostatistical area					
2000			2010		
BGA	**(%)**	**Level**	**BGA**	**(%)**	**Level**
San Felipe			**San Felipe**		
5895	-1.084723	Medium Low	5895	-3.282531	Low
5912	-0.930896	Medium Low	5912	-1.581694	Medium Low
			6446	-1.476186	Medium Low
5734	-0.624478	Medium Low	5734	-1.383275	Medium Low
4030	0.3274843	Medium High	4030	-1.202062	Medium Low
5397	0.5158813	Medium High	5397	-0.925541	Medium Low
526[a]	0.5324602	Medium High	526[a]	-0.431473	Medium Low
5255	1.9453939	Medium High	5255	0.1549008	Medium High
3032	3.8084194	High	3032	0.2704666	Medium High
3047	4.3093169	High	3047	0.2776485	Medium High
5240	4.376738	High	5240	0.2897682	Medium High
540[a]	5.3218296	High	540[a]	1.0919515	Medium High
3028	6.7400778	Medium High	3028	1.3111012	Medium High
			5908	1.3911547	Medium High
5274	7.1800441	Very High	5274	2.2484976	High
5414	11.035671	Very High	5414	10.50578	Very High
Michoacán de Ocampo			**Michoacán de Ocampo**		
5306	0.1260562	Medium High	5306	-0.382659	Medium High
Ejido Puebla			Ejido Puebla		
			7783	-2.19362	Medium Low
3329	1.3194359	Medium High	3329	-1.734811	Medium Low
			7798	-1.571337	Medium Low
			7374	0.134624	Medium High
5700	1.7273654	Medium High	736[a]	0.8580668	Medium High
			5700	2.7842308	High
5715	2.0188164	Medium High	5715	10.700148	Very High
394[a]	-0.340079	Medium Low			
Colonia Progreso			**Colonia Progreso**		
			7181	-1.284251	Medium Low
			7177	-1.212251	Medium Low
			7162	-1.088001	Medium Low
			6836	-1.083579	Medium Low
			6291	-0.501847	Medium Low
5344	1.5684685	Medium High	5344	0.3885867	Medium High
5486	1.8475134	Medium High	5486	0.4997858	Medium High
			3070	0.7938382	Medium High
5611	4.1864265	High	5611	1.2775983	Medium High
			6319	1.4167928	Medium High
309[a]	4.5130585	High	309[a]	1.57839	Medium High
3085	4.8804015	High	3085	2.0270497	Medium High
5359	5.2155727	High	6287	2.9902064	High
			5359	3.2663548	High
3070	2.8625672	Medium High			

Table 4 continued…

Marginal index per basic geostatistical area					
2000			2010		
BGA	(%)	Level	BGA	(%)	Level
Ejido Coahuila			Ejido Coahuila		
572ª	-0.242187	Medium Low	572ª	1.3856936	Medium High
5185	0.7270371	Medium High	5185	2.4632792	High
519ª	1.2099173	Medium High	519ª	3.7898218	High
2941	3.8396533	High	2941	4.8646712	High
3973	4.3877466	High	3973	5.0297259	Very High
2937	5.4569154	High			
Ejido Nuevo León			Ejido Nuevo León		
			6431	-0.602511	Medium Low
5452	-0.192034	Medium Low	5452	-0.258514	Medium High
5448	0.9013771	Medium High	5448	0.9275468	Medium High
			7209	1.656793	Medium High
Colonia Carranza			Colonia Carranza		
2706	1.1740562	Medium High	2706	1.6134813	Medium High
2710	1.5142055	Medium High	2710	1.4366679	Medium High
2585	2.6949982	Medium High	2585	1.5032346	Medium High
5039	3.1974049	Medium High	5039	-0.969877	Medium Low
5043	5.4374507	High	5043	-0.994479	Medium Low
Guadalupe Victoria			Guadalupe Victoria		
4098	-0.984972	Medium Low	4098	-3.807695	Low
2960	-0.233119	Medium Low	2960	-0.97097	Medium Low
3121	1.0667229	Medium High	3121	-0.422123	Medium Low
3117	1.3929403	Medium High	3117	-0.234538	Medium High
			6821	-0.101694	Medium High
			6268	0.2633906	Medium High
2975	3.9256972	High	2975	0.804944	Medium High
5363	4.183682	High	5363	1.2967354	Medium High
5819	6.3087943	High	5819	1.6534077	Medium High
			7849	1.733308	Medium High
			6253	1.7952244	Medium High
5378	6.6849346	Very High	5378	3.3845862	High
3102	1.8616957	Medium High			
2602	2.406892	Medium High			

Source: Prepared by the author based on data from the General Population and Housing Census 2000 and 2010, INEGI.

Conclusion

The location, of the 10 localities from the case study, has allowed us to establish three accessibility scenarios with regard to the highway, which are: a) directly related to its layout and design, b) communicated through a feeder road, and c) communicated indirectly through the secondary network.

The localities of Mexicali and San Felipe, situated at the ends of the road, exemplify the localities directly related to this part of the Federal Highway No. 5. In both places most of the marginalization levels decreased, with significant improvements which reached low marginal levels in some BGAs. Mexicali City increased 15 times its BGAs quantity due to its population growth, meanwhile San Felipe only added 2 BGAs between one year and another. Likewise, Ejido Puebla, Colonia Progreso and Colonia Carranza localities decreased the UMI due to

their interconnections with the highway through a feeder road.

Furthermore, 5 localities indirectly associated with the Federal Highway No. 5 Mexicali-San Felipe section through the secondary network show lower benefits during the modernization work. For the Michoacán de Ocampo and Nuevo Leon localities, urban marginal levels were the same despite their proximity to the capital and lower distance to the highway section. The Delta station had an increase of 1 BGA and a minimal improvement on its marginalization levels; Guadalupe Victoria had an improvement in almost all of its BGAs marginal levels, regardless of its limited access to the highway.

This leads to a hypothesis for future work, the Guadalupe Victoria enhancement is directly related to its better access to Federal Highway Mexicali – San Luis Rio Colorado through feeder roads. Finally, Ejido Coahuila is the only locality with higher levels of marginalization due to its difficult access to the highway.

As a result the benefits obtained during the modernization process can be associated to the accessibility conditions of each locality, to urban redistribution processes (evident with the emergence of new BGAs) and to the strengthening of the economic sectors directly associated with various sections of the highway (industry and agriculture in the first section, mining in the second and tourism and fishing in the third section). This seems even more determinant than the geographic distance between the localities and the road axis. However, it is important to note that for purposes of this research and in order to obtain the UMI levels the methodology used took into account only the modernization effects over variables related to a better quality of life, such as education, health services and housing, being the accessibility the main cause of the UMI improvement. Therefore, localities that worsened their marginalization levels between one year and another, are those with greater access problems. Future research should evaluate other types of public and private investments made due to the Federal Highway No. 5 Mexicali-San Felipe modernization and their effects over the accessibility benefits obtained.

Conflict of Interests

The author has not declared any conflict of interests.

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Full Length Research Paper

Inclusive planning in Nigeria: A veritable tool for poverty reduction

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In perceived or real terms stagnation in the supply of poverty alleviation, materials and resources seems to be the order of the day in Nigeria. Even though there are core poverty eradication ministries and agencies, their benefits are not evenly distributed as expected. What we have is a development where some are favoured and others are not. The paper argues in favour of embracing inclusive planning as a veritable tool for the reduction of poverty in Nigeria. The data for the study which provides the basis for this paper were collected from secondary sources. Results show that up till now in Nigeria, 84.4% of the people are poor or moderately endowed. It is therefore suggested that transparency and accountability be employed as two aiding keys of poverty reduction.

Key words: Poverty, planning, Nigeria.

INTRODUCTION

Poverty in developing countries is pervasive and multi-dimensional as it is in Nigeria. As such, the design of poverty reduction programmes ongoing in Nigeria should reflect this multi-dimensional nature. It should incorporate economic, social, and cultural dimensions as well as the political dimension. Three approaches to poverty alleviation are discussed in the literature: economic growth, basic needs and rural development approaches.

The economic growth approach to poverty reduction is based on the fundamental assumption that economic deprivation is at the root of all poverty and that non-economic causes of poverty are only secondary, arising from the primary causes. Attention is therefore focused on rapid economic growth as measured by rate of growth in real per capita Gross Domestic Product (GDP) or per capita National Income (NI), price stability and declining unemployment, among others. All these are to be attained through proper harmonization of monetary and fiscal policies (Etim and Erotimi, 1976).

The approach works through trickle-down effects. The principle holds that, as economic growth continues, the effects will progressively trickle down to the core poor and most disadvantaged in society. However, the approach has the following shortcomings.

Firstly, there is nothing inherent in economic growth that automatically guarantees poverty alleviation. Secondly, economic growth can be likened to a case of 'digging a hole to fill another hole' That is even when it alleviates

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poverty in some segments of the society; it often creates new poverty or aggravates existing poverty in other segments of the society. Lastly, economic policies and growth are often untargeted to take care of special needs of the core poor in terms of education, health care, better housing condition and so on. So, given the pitfalls of economic growth, the basic needs approach has been favoured as a complementary approach (D'Silva and Bysouth, 1992; Yahie, 1992; and Olayemi, 1996).

The basic need approach (BNA) to poverty alleviation views poverty as being broad in perspective and that programmes should be targeted to tackle the wider causes of poverty (Bamburger, 1992). The basic needs may be described as those basic necessities which would enable the poor live a decent life. However, the basic needs vary from one country to another e.g. Russia and Nigeria. But most of them would include such things as food and nutrition, health care, education, shelter, clothing, transport and employment (Olayemi, 1996).

The rural development approach argues for total emancipation and empowerment of the rural sector. The sector is expected to be treated uniquely in terms of poverty alleviation strategies. The need for unique treatment was necessitated by three dominant factors. The first is the fact that most countries have a disproportionate high percentage of the poor living in the rural areas. The second is that food which is the most essential BNA to poverty alleviation is purely a rural business in developing countries. And the third is that the rural sector is often the weaker sector when compared with the urban sector.

The particular strategy which has received most attention is the Integrated Rural Development Strategy (IRDS) which involves a simultaneous, holistic and intersectoral manipulation of all necessary variables which together could alleviate poverty. The primary objective of IRDS is the provision of basic necessities of life which include food, employment and income-generating opportunities, information, shelter, clothing, education, health care, and other social services to the poor. This development strategy should be adequately integrated into the programme for sustainability of the programmes (Odusola, 1996). The components of BNA should be taken as clues to determine the scope and extent of the programme.

Notwithstanding, the availability of these approaches as instrument which can be employed in our country, no attending proportionate benefits accrue yet in the grassroots. Instead, there are cases of unemployment vis-à-vis high level of food importation (Manuaka, 2011:35; Sawyerr, 2012; Akpeji and Ajayi, 2012). What we have is growth without development which invariably breeds exclusion as few people determine resources distribution that are skewed in favour of those at the corridor of power, while citizens are deprived and marginalized in all ramifications (Akinola, 2007f:234).

More so, in spite of the declaration by Nigerian governments (Federal and State) to abide with MDGs' poverty reduction incentives, they are yet to understand how to engage institutional mechanisms. As such, the economy is in disarray and in shambles because the stakeholders in development - government officials, scholars, and industrialist/private sector as well as peasant farmers - operate on parallel lines, instead of as colleagues with equal standing within governance and development arenas. As long as stakeholders in governance and in development are not operating in synergy, poverty is forgone.

In connection with the above background, the paper argues in favour of embracing inclusive planning as a veritable tool for the reduction of poverty in Nigeria. The concept in question entails bringing together stakeholders in governance and development - government officials, scholars, and industrialists etc., to operate in synergy for the actualization of feasible and real poverty alleviation.

METHODOLOGY

The data for the study which provides the basis for this paper were collected from secondary sources. It involves review of literature upon which poverty alleviation approaches were discussed and clarification on the basic concept to place the study in its relevant theoretical framework. The data from National Bureau of Statistics also forms part of the secondary data used.

RESULTS AND DISCUSSION

The result show that in Nigeria 84.4% of the people are poor or moderate (Table 1) as 9.5% are very poor, 37.5% poor, 47.5% moderate, 5.2% fairly rich and 0.9 % rich. There is high magnitude of poverty in the urban and rural sectors. The same is applicable in the different States that make up the country. Implied in this is the need to inclusively plan to reduce poverty.

CONCLUSION AND RECOMMENDATIONS

The paper argues in favour of embracing inclusive planning as a veritable tool for the reduction of poverty in Nigeria. The data for the study which provides the basis for this paper were collected from secondary sources. In line with the above, two key factors recommended for inclusive planning workability are transparency and accountability. Transparency in inclusive planning and the extent to which stakeholders are informed will strengthen both their willingness and capacity to participate and take decision. It will increase the motivation of the people for creating sustainable results. An open exchange of information will lead to discussions about objectives among the key figures and promotes the willingness to reach a consensus. The dissemination of

Table 1. Percentage distribution of household livelihood in Nigeria based on Income.

	Very poor	Poor	Moderate	Fairly rich	Rich
National sector	9.5	37.5	47.5	5.2	0.9
Urban	6.1	30.1	56.2	6.3	1.2
Rural	11.6	41.9	41.2	4.5	0.8
States					
Abia	15.8	47.2	30.3	4.9	1.8
Adamawa	10.2	46.6	39.2	3.5	0.6
Akwa ibom	14.0	36.4	43.3	4.5	1.8
Anambra	10.1	37.5	45.0	5.1	2.2
Bauchi	7.1	42.3	41.9	8.1	0.6
Bayelsa	32.6	35.0	28.6	1.7	2.1
Benue	12.6	50.4	32.7	3.8	0.5
Borno	3.9	41.7	51.3	2.4	0.7
Cross river	17.0	52.7	26.0	3.7	0.7
Delta	13.2	43.5	36.2	6.0	0.7
Ebonyi	27.6	51.4	15.2	5.2	0.5
Edo	3.9	29.8	59.1	6.1	1.1
Ekiti	8.0	37.6	51.1	2.7	0.6
Enugu	13.2	36.2	42.2	7.7	0.8
Fct abuja	3.3	39.0	55.6	1.3	0.8
Gombe	7.5	42.6	46.3	2.9	0.8
Imo	20.5	46.7	30.4	1.8	0.8
Jigawa	4.9	30.7	56.0	7.3	1.0
Kaduna	8.8	43.5	38.2	9.0	0.5
Kano	11.5	41.9	40.8	5.2	0.6
Katsina	7.9	40.8	46.2	4.5	0.7
Kebbi	6.6	39.6	46.3	5.3	2.2
Kogi	5.8	32.2	58.7	2.9	0.4
Kwara	3.8	36.6	57.0	2.4	0.2
Lagos	4.3	20.5	66.2	8.3	0.7
Nassarawa	7.0	26.9	60.0	5.9	0.2
Niger	6.9	25.1	59.6	7.7	0.7
Ogun	2.7	21.8	69.2	5.2	0.1
Ondo	5.9	46.4	44.2	3.4	0.0
Osun	1.9	23.6	65.3	7.0	2.3
Oyo	7.6	38.3	49.5	3.9	0.6
Plateau	7.6	31.1	55.9	4.0	1.4
Rivers	12.0	45.9	33.9	6.2	1.9
Sokoto	8.6	23.3	59.4	7.5	1.1
Taraba	10.1	54.3	29.8	5.4	0.4
Yobe	11.0	35.4	49.7	3.3	0.5
Zamfara	15.3	37.2	43.6	2.8	1.0

Source: National Bureau of Statistics (Abubakar, 2013:108).

information in the local language(s) will contribute to an improved transparency. In addition, it will strengthen the trust of the population in poverty reduction programmes.

Accountability will require that institutions and individuals know that their performance or lack of it matters. If it is to find ways to hold donors, experts and businesses more accountable for their participation in development projects associated with poverty, Nigerian

government will have to develop its own monitoring capacities and to identify and publicize ways of present accountability. Establishing accountability mechanisms to measure the roles of the various actors in the chain also will require new and independent dedicated body that has no stake in the outcomes of the projects. The body would be mandated to go behind the typical statistics to detect impact at village level and also measure the relative responsibility and accountability of the chain of stake-holders. Accountability thus would require transparency and collaboration among all actors.

Conflict of Interests

The authors have not declared any conflict of interests.

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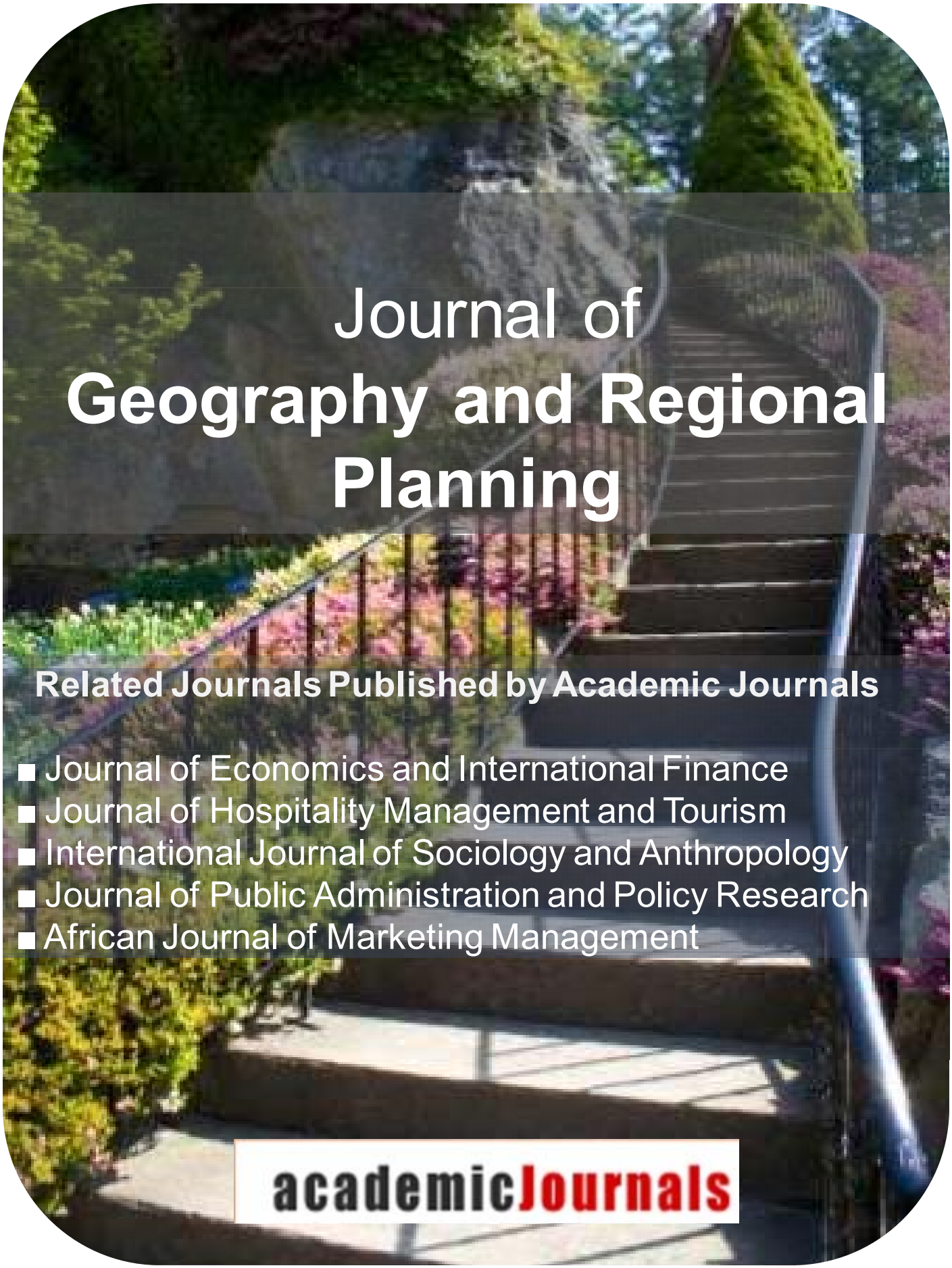

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