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Regional Disparities in Public Transport –A Study in Madurai District

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Abstract

Objectives: This paper examines the satisfaction level of villagers towards the public transport facilities provided by the Government with respect to factors like: frequency of public transport, waiting time by villagers for buses, bus provision to different areas in Madurai, number of buses operated in Utchapatti village route and service quality of public transports. **Methods/Analysis:** The study is a descriptive study with survey method. An interview schedule was prepared to solicit responses from villagers. The sample constituted 200 respondents from the Utchapatti village. Convenience sampling method was adopted for collecting the primary data through interview schedule. Secondary data were collected from websites and books. The data were analysed using appropriate statistical techniques such as Percentage analysis, weighted average, ANOVA and multiple regression. **Findings:** Compared to the bus provision to different areas and number of buses operated to the village, frequency of the bus operation is ranked high as per weighted average ranking. According to the multiple regression analysis, the variables frequency of buses and the commute time are identified as the major factors responsible for disparity in rural transport. **Applications/Improvement:** This paper provided a bird's eye view of need for inclusive economic growth system which is to be initiated with mobility through provision of public transport to remote areas and the policy recommendations need to be reinvented by the Government.

Keywords: Madurai District, Public Transport, Regional Disparity, Transport Facilities, Village Transport

1. Introduction

Globalization is a major source of change. The present globalisation has caused the development of transport. Mobility is vital for development. Transport has a critical role to play in the infrastructure development of the nation. The new developments have provided opportunities to public in various spheres. But the process is uneven between rural and urban regions. Rural areas receive a very less share of public funds for their development. India has 6.5 lakhs villages and a few small towns. Villages are recognized through a proper definition of nearly 2/3 of their work must be related with agriculture and allied services and the population should be below 5000(according to the census). The total GDP from among the rural India is about Rs.600 thousand crores. Compared with other countries, the rural population density is high and the average being two hundred and fifty people per sq.km. Many villages in India are not provided with proper public transport facilities. Thus the benefits of globalisation are not realizedevenly by all. There is a need for inclusive economic growth system which is to be initiated with mobility through provision of public transport to remote areas. Uchapatti is tiny village placed in Thirumangalam Taluka of Madurai district, Tamil Nadu with a total population of only 1024 families [Figure 1]. The Uchapatti village has the total population of 3936 out of which 1987 are males and 1949 are females.(Population Census 2011). In Uchapatti village the average age of children belongs to 0-6 is 482 which comprises of 12.25 % out of total population in the village. The average Sex Ratio of Uchapatti village is 981 and it is

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comparatively lower than Tamil Nadu state average of 996. Child sex ratio (967), higher than the State average (943). The village literacy rate (81.38%) is higher than the state average (80.09%). In Uchapatti Male literacy (86.91%) is more than the female literacy rate (75.76%). The village is governed by Sarpanch (Village head) who is elected as representative of village.

Uchapatti village has a considerable population of Schedule Caste comprising of 26.47 %. Out of total population, 1812 were engaged in agricultural related work activities. 93.38 % of population portrayed theiremployment or earning more than 6 Months while 6.62 % were engaged with marginal activity for livelihood with less than 6 months.

Although many attempts were made to study the rural transportation, the available researches have given a view on disparity of public transport availability in rural villages. In a book, "Activity-Based Methodology to Ascertain Transportation Needs and Allocate Financial Support for Rural Bus Service", discussed the various aspects like transportation needs, level of service, levels of subsidy requirements and the like[1]. It was also stated that the regular conventional bus services could not be operated at acceptable costs to the commuters even though it was essential as dispersed irregular transport demand would result in high operating cost. Smith provided rich insights into the problems faced by local governments in administering public transport and provided a modus operandi for a change in policy and administrative set up. In a study, "Systems Approach to Transportation Planning", has emphasized the need to integrate all modes of transport in an urban area under a unified authority on the plea that only such a framework can effectively plan and provide at reasonable cost the type and quality of service than the urban area requires for development[2]. The author has also stressed that to achieve better results in railways, more efficient operating and scheduling policies must be adopted. Researchers have made an attempt to study the public transport facilities offered to passengers, the rate of tickets and the service quality gaps along with their demographic factors such as income and car ownership. The study was carried out with an objective to prepare a guidance manual for public and private transport operators. The study identified the imbalance of availability of bus services among urban and rural population[3]. Other studies have presented that the minibus scheme had a positive response from rural people. Respondents were satisfied with the frequency, time schedule and the permission granted for carrying luggage. It was observed that the minibuses were overloaded with passengers in order to wipe out the cost. Though the owners were satisfied with the time schedules they were unhappy with the bus fare. Restricted number of operators per route and plying of minibuses only on the routes where the regular buses do not operate may make the scheme more attractive to the operators. It is also suggested to privatize the rural roads for motorable condition and educate the rural people on the maintenance of the roads. Increasing of bus fare for minibuses also could be considered to make the scheme attractive for the owners[4]. A study on Productive Efficiency and Ownership of Urban Bus services investigated the productivity differences between public and private bus service in Australia. Private supply of public passenger transport in general had performed more efficiently than public supply[5]. Another study stated that minibuses produced substantial benefits for both passengers and operators in

Figure 1. Map of Utchapatti village.

terms of faster journey speed, slightly shorter waiting time, greater penetration into the central area, and cheaper travel for distance over 7 miles (11 kms). It helped to minimise the cost and maximize the profit[6]. From a research report, it was identified that rural transport could be identified with five different operational features, namely, (1) voluntary effort by local residents in organizing and operating community transport services; (2) using small vehicles where demand is small and for narrow roads (3) arranging routes (schedules) according to pre-booked demand; (4) carrying passengers on vehicles making regular journeys for other purposes; and (5) linking remote areas to the main public transport network with feeder services[7]. Based on a study in Innovations in Rural Bus Services conducted by Department of Transport in Great Britain, the present system of licensing could hinder the efficient development of new services and that it needs reform. New services, such as mini-buses and shared cars should be developed according to the conditions of demand and should supplement the existing network of conventional buses in rural areas. There are two sets of operative forces namely, individual and geographical forces, cause spatial variations in the incidence of rural transport problem. He analyzed the inadequacy of rural transport through perception from both sets of forces and compared the same with other problems in the same localities. The results of the study indicated that transport is most commonly coupled with respondents' poor social life and 39 per cent of respondents have cited that transport was a problem. The percentage of respondents who have cited the other disadvantages of village life were social (18%), shops (13%), water (5%), education and medical (3% each), and others (19%). However, it was found that inadequate public transport was the greatest single problem in the overall problems of rural areas[8]. In India rural transport is backward; inadequate, inefficient and rural transport adversely affected the movement of rural people even after thirty seven years of planning[9].

As this village is located in the midst of the highway road and requires the bus service providers to pay toll-gate charges as they have to cross the border of Madurai district, they have to walk at least 20 to 25 minutes to reach the bus stop. This study intended to identify the focused objectives of knowing the socio-economic profile of Utchapatti village, Madurai district and the satisfaction level of villagers towards the public transport facilities provided by the Government with respect to factors like: frequency of public transport, waiting time by villagers for buses, bus provision to different areas in Madurai, number of buses operated in Utchapatti route and service quality of TNSTC.

2. Methodology

The study is a descriptive study with survey method. An interview schedule was prepared to solicit responses from villagers. The sample constituted 200 respondents from the Utchapatti village. Simple random sampling method was adopted for collecting the primary data through interview schedule. Secondary data were collected from websites and books. The data were analyzed using appropriate statistical techniques such as Percentage analysis, weighted average, ANOVA and multiple regression.

3. Results and Discussion

The study has provided the following demographic profile of the respondents.Majority (60%) of the respondents were below 35 years of age. Most of the respondents (62%) were unmarried.98.5% of the respondents were in the category of less than Rs.10000 monthly income.38% of the respondents were self-employed.80% of the respondents felt that frequency of buses to the village is low.88% of the respondents felt that waiting time for buses is high. Almost 72% of the respondents felt that bus provision from the village to different areas of Madurai district is very low. Most of the respondents (76%) felt that the number of buses operated to the village is very low. Only 49% of the respondents felt that the service quality provided by the Tamilnadu State Transport Corporation (TNSTC) is average

Compared to the bus provision to different areas and number of buses operated to the village, frequency of the bus operation is ranked high as per weighted average ranking. According to the multiple regression analysis, the variables frequency of buses and the commute time are identified as the major factors responsible for disparity in rural transport.

From the table it could be inferred that most of the respondents from the village were less than 35 years of age. Majority (78%) was male and 62% were unmarried. Most of the respondents from the village (60%) were below Rs.5000 income level. Almost 21% of the respondents were unemployed and 38% were self-employed[Table 1]. The table shows that the respondents have very low opinion towards the frequency of Government buses to the village. Almost 80% of the respondents stated that frequency is low and very low[Table 2].

It could be inferred from the table that 88% of the respondents felt that waiting time for buses is high during all the hours[Table 3]. The respondents of the village felt that

not many buses were provided to different areas of Madurai district from the village. 72% felt that provision of buses to different areas were very low[Table 4] and majority of the respondents (76%) felt that number of buses operated in that route is very low and 10% of the respondents felt that it is low [Table 5]. 49% of the respondents felt that the service quality of the Tamilnadu State Transport Corporation (TNSTC) is average[Table 6]. Based on the calculation of weighted average ranking from the above table, it could be inferred that frequency of buses is given rank I, followed by number of buses operated and bus provision to different areas with ranks II and III respectively. But it could also be inferred that the weighted average score for all the three variables are very low[Table 7].

Table 1. Demographic profile of respondents

S. No	Particulars		No of Respondents	%	Total %
1	Age	Below 25 yrs	48	24	100
		25 – 35 yrs	72	36	
		35 – 45 yrs	60	30	
		45 – 55 yrs	18	9	
		Above 55 yrs	2	1	
			Total-200		
2	Gender	Male	156	78	100
		Female	44	22	
			Total-200		
3	Marital Status	Married	76	38	100
		Unmarried	124	62	
		Widowed	0	0	
		Divorced	0	0	
		Others	0	0	
			Total-200		
4	Monthly Income	Below Rs.5000	120	60	100
		Rs.5000 – Rs.10000	77	38.5	
		Rs.10000 – Rs.15000	3	1.5	
		Above Rs.15000	0	0	
			Total-200		
5	Occupation	Government	26	13	100
		Private	56	28	
		Self-employed	76	38	
		Unemployed	42	21	
			Total-200		

Source: Primary Data

Table 2. Response towards frequency of Government buses to the village

Response	Number of respondents	% of respondents
Very high	4	2
High	2	1
Moderate	34	17
Low	58	29
Very low	102	51
TOTAL	**200**	**100**

Source: Primary Data

Table 3. Response towards waiting time for buses

Response	Number of respondents	% of respondents
Very high	126	61
High	54	27
Moderate	4	2
Low	11	5.5
Very low	5	2.5
TOTAL	200	100

Source: Primary Data

Table 4. Response towards Bus provision to different areas in Madurai

Response	Number of respondents	% of respondents
Very high	0	0
High	0	0
Moderate	24	12
Low	32	16
Very low	144	72
TOTAL	**200**	**100**

Source: Primary Data

Table 5. Response towards number of buses operated in Utchapatti route

Response	Number of respondents	% of respondents
Very high	12	6
High	4	2
Moderate	12	6
Low	20	10
Very low	152	76
TOTAL	**200**	**100**

Source: Primary Data

Table 6. Response towards Service quality of TNSTC

Response	Number of respondents	% of respondents
Very Poor	24	12
Poor	48	24
Average	98	49
Good	14	7
Very good	16	8
TOTAL	**200**	**100**

Source: Primary Data

An attempt is made to study the relationship between demographic variables and other factors of transport from the data collected from employees' perception. The relationship is examined using ANOVA. The opinions expressed by the respondents may differ depending upon their demographic variables. The above table shows that P value of age, income and the occupation of the respondent is greater than 0.05 and the null hypothesis are accepted. Therefore age, incomeand occupation of the respondents have no influence on transport factors such asfrequency of buses, bus provision to other places and provision to villages. On the other hand, gender has influence on the frequency of bus facilities and with provision of bus facility to villages. This is due to the factor that male members have access to their own vehicles like bicycles, two wheelers. The female members have to walk for long distances on their own [Table 8]. Multiple regression analysis is conducted for identifying the response from the villagers about their perception of diversity in transport facilities. The independent variables such as Fares too expensive, lack of frequent buses, too many bus stops, safety, and commute takes too much time, quality of service are considered.The present model t test exhibits that the predictors namely, 'Frequency of buses' and 'Commute time' are significant at 5%. Further it reflected that the predictors namely, 'Quality of services', 'Bus fare' and 'Safety' are not significant at 5% which shows that they are not influencing overall perception of disparity in rural transport This model presented the 84% total variance which represents 84 percent of the variations in the opinion by rural population and the Correlation value (R=.820) states that there is a high degree of correlation between overall rural transport factors related to their perception of disparity in transport[Table 9].

Table 7. Weighted average ranking towards the various transport factors

	Very high4	High	Moderate	Low	Very low	Weighted Average	Ranking
Frequency of buses	4	2	34	58	102	23.2	I
Bus provision to different areas	0	0	24	32	144	18.67	III
Number of buses operated in the route	12	4	12	20	152	20.27	II

Source: Primary Data

Table 8. Relationship between Demographic and the transport factor – ANOVA Single Factor

TRANSPORT FACTORS	P VALUE				RESULT			
	Age	Gender	Income	occupation	Age	Gender	Income	occupation
Frequency of buses	0.431	0.022	0.712	0.712	Accepted	Rejected	Accepted	Accepted
Bus provision to other places	0.231	0.118	0.348	0.348	Accepted	Accepted	Accepted	Accepted
Provision to villages	0.3891	0.021	0.721	0.721	Accepted	Rejected	Accepted	Accepted
Overall	0.412	0.145	0.190	0.182	Accepted	Accepted	Accepted	Accepted

Source: Primary Data (at 5% level of significance)

Table 9. t-test and regression coefficients accepted by the model for rural transport factors

Predictors	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.101	.098		11.72	.000
Quality of service	.121	.011	.203	4.121	.121
Bus fare	.045	012	.321	2.194	.109
Frequency of buses	.029	.013	.021	1.101	.021*
Commute time	.120	.024	.219	1.542	.013*
Safety	.309	.041	.312	4.109	.563

*Significant at 0.05 level

4. Conclusion

The most prevailing mode of transport to travel for short trip is often by foot, bicycles or motorcycles. Since majority of the respondents were employed and self-employed, they barely require mobility for their work. Also majority of the respondents were in the income group of below Rs.5000 and Rs.10000 monthly income, they could not access private buses. Keeping this in mind and focus, the Government should focus on the following policy measures to enhance transportation facilities to Utchapatti. Devising a public-private partnership in transport can allow private buses to reach the remote Utchapatti in spite of its high-way locality. Since it is a partnership with public corporation, private buses can be accessed by the villagers at a lower cost.As the respondents stated that frequency, number of buses operated and service quality are very low, the transport authorities need to concentrate their improvements in the following areas:Transport personnel can be trained in the areas of service provision, as service in intangible and is felt through the service providers who are in direct contact with customersAs waiting time for buses are felt to be very high, the route for buses can be redirected to reduce the same. To conclude, developing a comprehensive socially inclusive transportation policy, by focusing the policy measures on the diversity of the village, out-migration of youth (since majority of the respondents are below the age-group of 35 years) and freeing the buses operated to the village from toll-gate charges.

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