

## **AFFORDABILITY OF STREETLIGHT SERVICES BY GRAM PANCHAYATS IN KARNATAKA Status, Determinants and Ways Forward**

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### **ABSTRACT**

*Community lighting is a public good, the provision of which is considered to be essential to improve the quality of life and to promote orderly social life. Article 243G of the 73<sup>rd</sup> Constitutional Amendment transfers the function of rural electrification to Panchayati Raj Institutions (PRIs), wherein Gram Panchayats (GPs) are held responsible for the installation of electric transmission poles, and operation and maintenance of streetlights. In the context of limited fiscal decentralisation in Karnataka and growing dependence of GPs on grants from higher levels of government, the paper analyses the question of whether GPs can afford the provision of streetlight services. With the help of data collected from 5,212 GPs in Karnataka, the paper concludes that GPs are not able to afford the expenditure on operation and maintenance of streetlight services. Regression analysis on factors influencing the affordability of GPs in the provision of streetlight services shows that grants to GPs and the number of streetlights installed per 100 households are the main determining factors. The paper discusses the policy suggestions emerging from the analysis.*

### **Introduction**

There is growing attention to fiscal decentralisation (Aziz 1993; Vithal and Sarumathi 1996; GoK 2002a; Thimmaiah 2001; Rao *et al* 2003; Babu 2009; Rajasekhar and Manjula 2011) in the discussion on democratic decentralisation in Karnataka. These studies analysed the extent of revenue and expenditure autonomy among local elected bodies in Karnataka, and factors influencing fiscal decentralisation. But, how

exactly are local elected bodies in Karnataka performing in the expenditure functions relating to the provision of services such as streetlighting that are already assigned to them? Streetlighting is a public good, the provision of which is considered to be essential to improve the quality of life and to promote orderly social life. Issues relating to streetlighting, in general, and affordability of streetlight services by local elected bodies, in particular, have received scarce attention in the literature on decentralisation<sup>1</sup>.

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The authors thank Prof. G Thimmaiah, Prof. Gopal K Kadekodi, Prof. Abdul Aziz, Dr. K G Gayathri Devi, Ms. Suchitra J Y and Dr. K H Anantha for their comments and suggestions on an earlier draft of the paper, and Prof. S Madheswaran and Dr. Erlend Berg for their help in undertaking regression analysis. Thanks are also due to an anonymous referee for comments, and to late Mr. T R Satish Chandran for his comments and encouragement.

Community lighting, as a part of rural electrification programmes, gathered momentum in India after the Third Five Year Plan<sup>2</sup>. In Karnataka, only 7 per cent of the towns and villages were electrified in 1959 (GoK 2002b). Subsequently, there was a rapid growth in the number of electrified villages, and by 2001 itself, the State government achieved the target of 100 per cent (Rajasekhar *et al* 2010).

Article 243G of the 73<sup>rd</sup> Constitutional Amendment transfers 29 matters (mentioned in the Eleventh Schedule of the Constitution) to PRIs. Item 14 in the Eleventh Schedule is related to rural electrification including distribution of electricity. Zilla Panchayats (ZP)<sup>3</sup> in the State are responsible for identifying villages, hamlets and colonies that are to be electrified, and formulate projects for their electrification in coordination with Karnataka Power Transmission Company Limited (KPTCL). Gram Panchayat is responsible to find land suitable for installing electric transmission poles, and operate and maintain streetlights. Section 58 of the Panchayat Raj Act, 1993, notes that GPs have the obligatory duty to provide adequate number of streetlights and pay electricity charges regularly (GoK 2002a). Regular payment of electricity bills implies that there must also be provision for finances. Section 206 of Karnataka Panchayat Raj Act, 1993 states that "*the Government shall make annually a grant to each Gram Panchayat which shall be utilised for meeting the electricity charges, maintenance of water supply schemes, sanitation and other welfare activities*" (emphasis ours). The grant referred in this Section pertains to annual untied grant provided to each GP in the State since the early 1990s. Beginning with annual grant of ₹ one lakh per GP in 1993-94, the grant increased to ₹ 3.5 lakh in 2000-01 and to ₹ 5 lakh by 2003-04. Subsequently, this was increased to ₹ 6 lakh in 2006-07 and to ₹ 8 lakh for the year 2011-12.

Untied funds contribute to expenditure autonomy of local elected bodies. Gram panchayats cannot function as 'institutions of self-government' unless they are endowed with untied funds which can be spent on activities prioritised by the people in the gram sabha. But, Section 206 allowing GPs to use untied grants for the *provision of services*, virtually negates the principle with which untied funds are provided. Further, the use of grants in the provision of services introduces negative incentives to GPs and weakens the downward accountability.

### Objectives and Methodology

It is in this context that we aim to examine the affordability of GPs in the provision of streetlight services. Affordability implies the capacity of GPs to provide services with fees mobilised from users towards the provision of service in question. It should be, however, noted that we do not advocate in this paper that the provision of streetlight services should solely be based on whether fees collected is sufficient to provide these services or not. The issue of affordability of GPs in the provision of streetlights is important because it has policy implications. The 13<sup>th</sup> Finance Commission observed that the local bodies have indicated that, due to paucity of funds, they are unable to provide and maintain the quality of basic services such as drinking water, sanitation and streetlights.

The specific questions raised in this paper are the following: At what cost, gram panchayats are providing streetlight services to rural people? Can they afford the provision of streetlight services? What factors determine the affordability of streetlight services by GPs? What policy suggestions emerge from the analysis? This paper seeks to address these questions with the help of data on receipts and expenditure collected

from 5,212 GPs<sup>4</sup> in Karnataka for the year 2002-03. The data on electricity charges towards the provision of streetlight services for each GP were collected from KPTCL.

For the analysis, the districts<sup>5</sup> of Karnataka were classified into four categories (highly developed, developed, backward and highly backward category) on the basis of per capita income for 2002-03. The purpose of this categorisation was to see whether the economic development status of the districts had any influence on the performance of the gram panchayats in the provision of streetlight services. The highly developed category of districts consist of Bangalore Urban, Bangalore Rural, Chikmagalur, Dakshina Kannada, Kodagu, Mysore and Udupi. The districts of Belgaum, Bellary, Dharwad, Shimoga and Uttara Kannada come under the developed category. The backward districts comprise Bagalkot, Chamarajanagar, Davangere, Hassan, Haveri, Mandya and Tumkur. The highly backward districts are Bidar, Bijapur, Chitradurga, Gadag, Gulbarga, Kolar, Koppal and Raichur.

### Status of Community Lighting in Karnataka

The total number of villages and hamlets covered by 5,212 GPs was 49,473; of them, 67 per cent (or 33,098 villages) were provided with streetlights. The average size of the village increases as one moves from highly developed to highly backward category of districts (Table 1). The district-wise variations in the percentage coverage of rural habitations with streetlights follow the agro-climatic features in the State. In the hilly districts of Chikmagalur, Dakshina Kannada, Kodagu, Shimoga, Udupi and Uttara Kannada, the number of habitations in each GP was not only large but also were scattered. In these districts, the proportion of habitations covered with streetlights was relatively less<sup>6</sup>. In other districts, especially in highly backward and backward districts, the coverage was better. This is along the expected lines because the number of villages in the jurisdiction of GPs in these regions is small, and the size of villages is generally large. Even then, the coverage was lower in the backward and semi-arid districts like Bagalkot, Bijapur, Gulbarga and Raichur.

**Table 1: Background Information on Streetlight Provision and Number of Streetlights**

Category of Districts	Size of the village	Habitations with streetlights (%) to total	Number of streetlights installed per habitation	Number of HHs per streetlight
Highly Developed	102	57.15	25	7
Developed	104	37.86	39	7
Backward	155	90.65	30	6
Highly Backward	198	91.56	45	5
State	135	66.90	34	6

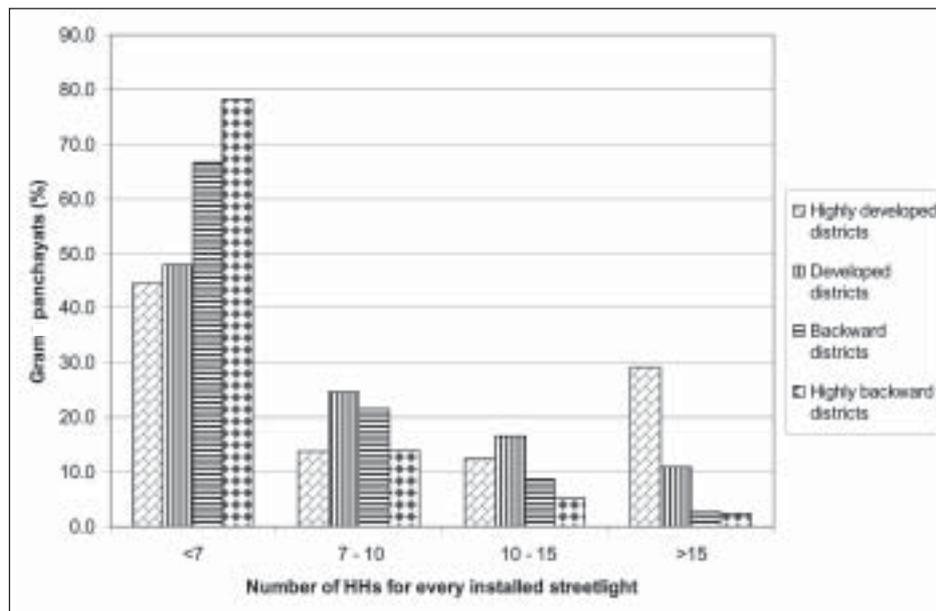
Note : The source for this as well as the following and charts is data collected from gram panchayats.

The total number of streetlights installed in all the 33,098 habitations in the State was 1,136,452 in 2002-03. The number of streetlights per habitation in the State was 34 (Table 1). Since the total number of streetlights installed in a habitation is function of the size of habitation and bargaining power of the GP, one can expect inter-district variations in the number of streetlights installed in each GP. The average number of streetlights installed varied from as low as 15 in Chikmagalur to as high as 82 in Gadag. Since the average size of villages is generally larger in northern Karnataka, the average number of streetlights installed was higher in all the districts in this region than the State average. On the other hand, the average size of the village is known to be small in the hilly (Malnad) region. In these districts, the number of installed streetlights in each GP was lower than the State average. Thus, the installation pattern followed the size of the

village, except in the case of developed category of districts, where the average size is generally large (particularly in Belgaum, Bellary and Dharwad) and this resulted in the larger number of streetlights per habitation.

The norm in the State is that gram panchayats should install 10 to 15 streetlights for every 100 households at a distance of 35 metres between two light poles (GoK n.d.). In other words, one streetlight should be installed for every 7-10 households. This norm was met only in 18.5 per cent of GPs in the State (Chart 1). The proportion of GPs installing a streetlight for less than seven households was higher in backward districts as compared to developed districts. Quite a few GPs from highly developed or developed have had under-coverage. In other words, one streetlight was provided for more than 15 households (Chart 1).

**Chart 1: Distribution of GPs by Number of Households Covered for Every One Installed Streetlight**



### Expenditure and Receipts on the Provisions of Streetlight Services

In order to provide streetlight services, gram panchayats incur expenditure on electricity and maintenance. While the data on maintenance (such as replacement of bulbs) expenditure were collected from the GP records, that on electricity charges for each GP towards streetlights were obtained from KPTCL. As far as revenue is concerned, light cess is imposed by GPs as part of the house tax. Some GPs have collected cess on streetlights and have provided the data separately, while others did not provide the same. In the case of those GPs which have not provided the data, we have arrived at the light cess by taking a notional figure of ₹ 5 per household based on the discussions with

Gram Panchayat Secretaries who reported that this has been the normal practice<sup>7</sup>. It may be noted that the analysis on affordability of streetlight services is confined to 5,088 GPs (rather than 5,212 GPs for which the data were originally collected) because the data on electricity charges on streetlights were not available for the remaining 124 GPs.

Table 2 shows that the total expenditure on providing streetlight services by 5,088 GPs was ₹ 95.83 crore. On an average, each GP spent ₹ 188,341 for providing streetlight services during 2002-03. The expenditure was somewhat high in the highly backward districts. Table 2 shows that the expenditure on streetlights consisted of payment towards electricity charges and maintenance. Let us now examine each of these in some detail.

**Table 2 : Expenditure on and Receipts Towards the Provision of Streetlight Services**

(₹ in lakh)

District	Expenditure			Receipt	Electricity charges to total expenditure (%)	Maintenance charges to total expenditure (%)	Light cess to total expenditure (%)
	Electricity charges for streetlights	Maintenance charges	Total	Light cess			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>Highly Developed</b>							
Bangalore Urban	276	88	364	13	75.74	24.26	3.45
Bangalore Rural	418	129	546	16	76.42	23.58	2.87
Chikmagalur	179	89	268	9	66.70	33.30	3.52
Dakshina Kannada	99	62	161	12	61.32	38.68	7.35
Kodagu	40	67	108	5	37.48	62.52	4.76
Mysore	315	105	420	10	74.92	25.08	2.49
Udupi	71	71	142	9	50.10	49.90	6.26
Total	1,397	612	2,009	74	69.52	30.48	3.68
<b>Developed</b>							
Belgaum	360	144	505	45	71.38	28.62	9.00
Bellary	199	79	278	11	71.60	28.40	4.07

(Contd.)

Table 2 : (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dharwad	104	52	156	10	66.89	33.11	6.67
Shimoga	191	91	282	45	67.73	32.27	16.15
Uttara Kannada	140	71	211	10	66.54	33.46	4.68
Total	995	436	1,431	123	69.50	30.50	8.56
<b>Backward</b>							
Bagalkot	198	76	273	19	72.34	27.66	7.04
Chamarajanagar	196	50	247	9	79.53	20.47	3.48
Davangere	227	106	334	11	68.16	31.84	3.41
Hassan	380	222	602	16	63.16	36.84	2.62
Haveri	200	88	288	16	69.45	30.55	5.41
Mandya	560	134	695	12	80.68	19.32	1.76
Tumkur	498	225	723	20	68.89	31.11	2.80
Total	2,260	901	3,161	103	71.49	28.51	3.26
<b>Highly backward</b>							
Bidar	188	38	227	12	83.14	16.86	5.33
Bijapur	185	80	265	40	69.78	30.22	14.90
Chitradurga	309	99	408	11	75.73	24.27	2.77
Gadag	124	48	172	9	72.20	27.80	5.33
Gulbarga	506	91	597	25	84.72	15.28	4.24
Kolar	609	115	724	15	84.13	15.87	2.05
Koppal	182	78	260	13	70.01	29.99	4.90
Raichur	258	71	329	11	78.47	21.53	3.30
Total	2,361	620	2,981	136	79.21	20.79	4.55
All districts	7,013	2,570	9,583	435	73.18	26.82	4.54

*Expenditure on Electricity* : The calculations of electricity charges by KPTCL depended on whether a meter was fixed by GP or not. For metered installations, the tariff charges included fixed charges (₹ 50 per KW of sanctioned load) and energy charges (₹ 3.10 per unit consumed in the month). For unmetered installations, ₹ 1,200 per KW per month was charged. Only 8.7 per cent of GPs in the State installed meters during 2002-03.

We were informed that exact electricity charges on the basis of the actual consumption could not be arrived even in the case of the GPs where meters were fixed. This is because a lot depended on whether GPs monitored the electricity consumption or not, or whether meter reading was actually done or not. The field level observations suggest that although some GPs had installed meters, they were not put into effective use.

As a result, the method of charging ₹ 1,200 KW in a month was widely practised in Karnataka. Thus, KPTCL arrived at the consumption of electricity on notional basis in the case of large proportion of GPs. This essentially meant that the electricity consumption was arrived at on the basis of number of streetlights installed, type of bulbs used and average number of hours for which community lighting was provided. This means that the predominant method used to arrive at electricity charges on streetlights was notional, and this did not reflect the exact consumption of electricity for providing this service.

Another important point to note is that electricity charges<sup>8</sup> were deducted at the source from statutory grant provided to each GP. This method was introduced for two reasons. First, in the 1990s, there was a widespread problem of accumulation of electricity arrears as GPs found it difficult to pay electricity charges due to poor tax base and enhancement of electricity tariff. This method continued regardless of whether the financial situation of GPs has since improved or not. Second, it was convenient for KPTCL to collect electricity charges from ZP as they did not have to incur costs in the collection of electricity dues (delivery of bills to GPs, collection of dues from each GP and following up if electricity charges were not paid). Whatever may have been the reason, deductions at the source have had two types of adverse impact. a) This negated the basic principle of untied grants<sup>9</sup>. b) Many GPs were not aware of the total expenditure towards electricity consumption for different services, in general, and the provision of streetlights in particular. This was an important reason why many GPs could not provide information on amounts of electricity charges for streetlight provision. Hence, as noted earlier, we had to collect these data from KPTCL. As is well known, if there is no precise idea on

the expenditure incurred, accountability (both upwards and downwards) mechanisms become weak.

The total expenditure on electricity incurred by all GPs to provide streetlight services was more than ₹ 70 crore. On an average, each GP spent ₹ 137,833 towards the electricity charges for providing streetlight services. The proportion of electricity charges to total expenditure was nearly three-fourths at the State level. While the proportion of expenditure on electricity to total was lower in regions that consisted of coastal and hilly districts as compared to the others. For instance, expenditure on electricity accounted for only about 37 per cent in the hilly district of Kodagu, while it was nearly 85 per cent in Gulbarga. These variations can partly be explained in terms of differences in the settlement pattern and the resultant differences in the installation pattern of streetlights. However, the annual expenditure of ₹ 1.38 lakh per GP in Karnataka was rather high given that streetlights are not often lit the whole of night on account of scheduled and unscheduled power cuts and disruptions in the electricity supply (GoK 2002b).

*Expenditure on Maintenance of Streetlights* : GPs incur expenditure on maintenance of streetlights such as replacement of bulbs, tubes and, at times, the entire lighting equipment. The total expenditure on maintenance by all GPs was ₹ 25.7 crore and the average expenditure was ₹ 50,509 in 2002-03. The proportion of maintenance charges to the total expenditure was only 27 per cent. Although the expenditure on maintenance charges was less, this has not been uniformly the same across different districts. For instance, in districts such as Kodagu, Udipi, Hassan, Chikmagalur, etc., the maintenance charges formed a substantial proportion of the total

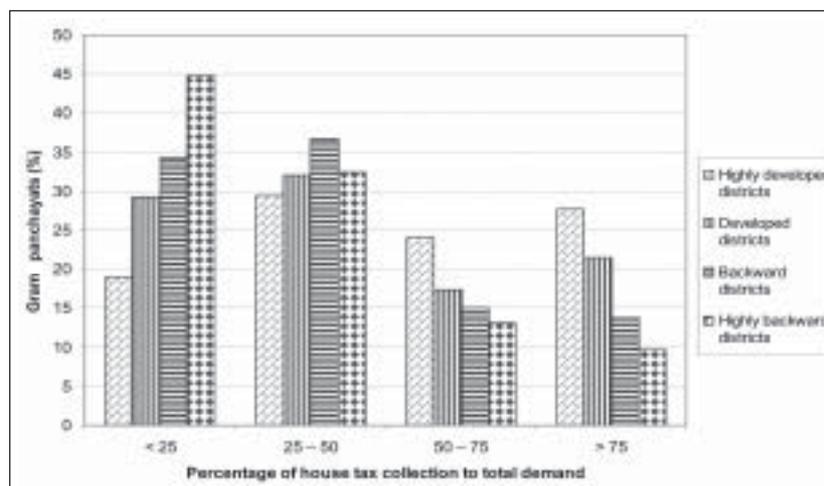
expenditure. In general, the proportion of expenditure on maintenance charges was comparatively higher in the highly developed and developed category of districts largely due to hilly terrain in coastal and hilly districts necessitating regular maintenance on streetlights.

*Receipts Towards the Provision of Streetlights* : As noted earlier, light cess, collected as a part of house tax, constituted an important receipt towards the provision of streetlight services in rural Karnataka. Although GPs, on an average, incurred considerable expenditure on the provision of streetlight services, the average revenue in the form of light cess was only ₹ 8,554 in 2002-03. The revenue has been, thus, very small in comparison to the total expenditure on streetlight services. The same is borne out from the proportion of light cess to total expenditure in Table 2, which shows that the light cess met only less than five per cent of the total expenditure. The proportion of light cess to total expenditure was very low in Mandya, Mysore, Kolar, Hassan and Bangalore Rural. In some of the poorer districts in northern Karnataka such as Bagalkot, Bijapur,

etc., the light cess formed somewhat higher proportion of the total expenditure. In only two out of 27 districts, the proportion of light cess to total expenditure was more than 10 per cent. Thus, there are district-wise variations in the revenue collected to provide streetlight services; and these variations do not entirely follow the developed and/ or backward status of districts.

It is, thus, clear that the light cess collected was not adequate to meet the expenditure. One factor can be thought of at this place as possible reason for the low proportion of light cess to total expenditure on streetlight services<sup>10</sup>. Low proportion of light cess in the total expenditure on streetlights was because of the poor collection of house tax itself. Chart 2 corroborates this. In the case of a large proportion of GPs across the State, the percentage of collection to the total demand on house tax was less than 50 per cent (Chart 2). Only in the case of highly developed and developed categories of districts, was the proportion of GPs collecting more than 75 per cent of the dues significant.

**Chart 2 : Distribution of GPs (%) by Proportion of House Tax Total Collection to Demand**



### Affordability of Streetlight Services

In order to analyse the affordability of streetlight services in each GP, a ratio of expenditure (on electricity and maintenance) to the revenue (light cess) has been worked out. This ratio shows the amount spent on providing streetlight services for every rupee of revenue received by each GP. Higher the ratio, less is the affordability of GPs to provide streetlight services. This is because GPs will have to meet the expenditure on streetlight services by diverting larger proportion of untied grants provided by the State government. Lower the ratio, greater ability of GP to provide streetlight services with its own revenue. This further implies lesser dependence on the untied grants provided by the State government and more spending on priority needs of the people.

A distribution of GPs by ratio of expenditure to the revenue is provided in Table 3. Across different GPs in the State, the expenditure for every rupee of the revenue was as low as ₹ 0.61 to as high as ₹ 6,661. The average ratio of expenditure to receipt, which was ₹ 103.93 in the State varied across the districts. There were also variations across the districts in the

distribution of GPs by ratio. In the case of as many as 40 per cent of GPs in the State, the expenditure was between ₹ 20-50 for every one rupee of revenue. In the case of 22.3 per cent of GPs, the expenditure was ₹ 10-20 for one rupee of revenue. Notably, about 15 per cent of GPs spent less than ₹ 10 for every one rupee of revenue that they collected in the form of light cess. In the case of about 23 per cent of GPs, the expenditure was more than ₹ 50 for one rupee of revenue.

The proportion of GPs spending less than ₹ 20 for one rupee of revenue was relatively higher in Bijapur, Belgaum, Bagalkot, Dakshina Kannada, Kodagu, Udupi and Uttara Kannada. In some of the districts of highly developed category such as Bangalore Rural, Chikmagalur and Mysore, the proportion of GPs spending between ₹ 20-50 was quite prominent. Similarly, this proportion is significant in the districts like Chitradurga, Kolar, Raichur, Hassan, Tumkur, Mandya, Chamarajnagar from highly backward and backward category of districts.

The information, thus, shows that there are wide variations in the affordability of streetlight services by Karnataka GPs. These

**Table 3 : Distribution of GPs (%) by Ratio of Expenditure on Streetlights to Total Receipts**

Category of Districts	Ratio of expenditure to receipt					Total	Minimum ratio	Maximum ratio	Average ratio
	< 10	10-20	20-50	50-100	>100				
Highly developed	16.53	24	36.71	14.76	8	1,125	0.61	2743.72	45.77
Developed	24.19	29.38	32.54	9.32	4.57	1,137	0.83	2334.53	32.15
Backward	6.18	17.6	48.13	18.1	9.99	1,392	1.27	1016.92	52.7
Highly backward	15.97	19.87	38.7	15.34	10.11	1,434	1.11	6661.05	60.15
State	15.25	22.29	39.47	14.62	8.37	5,088	0.61	6661.05	48.67

Source: Data provided by the GPs.

variations do not exactly follow the economic status of a district. For example, most of the GPs in Mandya, Mysore and Bangalore Rural, known to be developed in economic terms, spent more than ₹ 20 for every one rupee of revenue that they have collected.

### Factors Contributing to Affordability of Streetlight Services

The function of management and operation of the streetlights is, thus, costly for gram panchayats. Very high ratios of expenditure to one rupee of receipts can be interpreted as inefficiency on the part of GPs in the management of streetlight services. These can also be interpreted as burdening of GPs with an expenditure function without a viable alternative arrangement for revenue autonomy.

A regression model is, therefore, worked out to analyse the factors influencing the affordability with the ratio of expenditure as dependent variable. The model has been worked out by taking the ratio of expenditure to receipts as dependent variable and the explanatory variables as mentioned in Table 4. The dependent variable is expressed in log terms because it makes the distribution more normal and the results can be expressed in proportionate terms. Another reason is that, since the data used in the regression model is cross-sectional, the log of ratio of expenditure to receipt has been taken to avoid heteroscedasticity. The fixed effects have been worked out at the district level.

We have considered the following eight independent variables. (a) Per capita total grants (in ₹) of the GP. (b) Per capita own revenue (in ₹) of the GP. (c) Meter fixed (1 = If meter is fixed; 0 = otherwise). (d) Gender (1 = If the GP president is male; 0 = otherwise). (e) Education of the president (1 = if the educational qualification is less than primary; 0 = others). (f) Age (in years) of the

GP president. (g) Age square. (h) Number of households for every installed streetlight in the GP. The results at the level of State and four regions (Table 4) are statistically significant and explain the variation in the dependent variable. In the ensuing paragraphs, we will discuss the results.

Very significant results have been obtained with regard to the number of households for every installed streetlight. The results show that this variable is negatively associated with the ratio and highly significant at the level of State as well as across the regions. This can be explained as follows. The norm in the State that one streetlight should be installed for every 7-10 households in a village. If the GP installs streetlights above the norm, it will be incurring more expenditure on the provision of streetlight services. The results show that an increase of one household for every installed streetlight would reduce the expenditure by 2 paise of expenditure at the State level, and between 1 to 4 paise across the regions. This result suggests that if a GP installs a streetlight for less than seven households, the costs on streetlights will go up. As can be seen in Chart 1, the GPs installing one streetlight for less than seven households (excessive coverage) comprise about 61 per cent in the State.

Regression results show that per capita total grants increase the ratio of expenditure for every rupee of receipts, and this was found to be statistically significant at the state level and in the backward districts. This can be explained in terms of fly paper effect (Gramlich 1998; Courant *et al* 1998), which implies that larger the amount of grant to each GP less is the incentive to mobilise own revenue. In Karnataka, GPs receive general and specific purpose grants<sup>11</sup>. The results suggest that size of the total grant to GPs influences their expenditure behaviour.

**Table 4: Determinants of Ratio of Expenditure on Streetlights Per Every Rupee of Receipt  
Dependent Variable = Log (Ratio of Expenditure to Receipt)**

Independent Variables	Coefficients at the level of				
	State	Highly developed districts	Developed districts	Backward districts	Highly backward districts
Per capita total grants (₹)	0.00071**	0.00036	0.00074	0.00087*	0.00062
Per capita own revenue (₹)	-0.00016	0.00164***	-0.01108***	-0.00561***	-0.00997***
Has metre been fixed?	-0.04579	0.00261	0.01173	0.09495	-0.20929***
Sex of the President	-0.03637	0.04379	-0.07031	-0.08629**	0.00138
Education of President	-0.02147	-0.01942	-0.05643	0.00780	0.02087
Age of the GP president (in years)	-0.00012	-0.01239*	0.00639	0.00433	-0.00443
Age square	-0.00001	0.00014	-0.00014	-0.00012***	0.00011
Number of households for every installed streetlight in the GP	-0.01538***	-0.01106***	-0.01843***	-0.04195***	-0.03732***
Constant	3.37055***	3.48861***	3.22624***	3.85806***	3.59797***
Fixed effects	Yes	Yes	Yes	Yes	Yes
Number of observations	4777	1034	1070	1312	1361

\*\*\* Significant at 1% level;

\*\* Significant at 5% level;

\* Significant at 10% level.

Larger grant amounts allow GPs to spend resources on the operation and maintenance of streetlights in somewhat indiscriminate manner, and this, in turn, increases the ratio of expenditure to receipts on streetlights services.

We obtain very interesting results pertaining to per capita own revenue. Theory says that fiscal decentralisation requires the assignment of taxes and other sources to local governments that provide significant own revenue. Larger the own revenue more will be participation of people in the affairs

of the local government and greater will be the accountability on the part of local government towards people. "Voters will hold their elected officials more accountable if local public services are financed to a significant extent from locally imposed taxes, as opposed to the case where financing is primarily by Central government transfers" (Bahl 2002:261). These theoretical considerations suggest that there will be negative relationship between per capita own revenue and the ratio. If the per capita own revenue is high, it then implies that people are widely participating in the

payment of taxes. This will in turn result in people asking for accountability on how their hard earned money is spent. This is expected to influence the behaviour of GPs in such a manner that they will be careful when it comes to spending resources mobilised from the people on the provision of services such as streetlights.

Although per capita revenue reduces the ratio, this was not statistically significant at the State level. However, this variable is highly significant in all the four regions. A highly significant negative association between per capita own revenue and the ratio in developed, backward and highly backward districts implies that higher amounts of own revenue improved the affordability of GPs. The sign is, however, positive in the highly developed category of districts. This is because of Bangalore Urban and Rural districts, which fall into the category of highly developed districts. In these districts, house tax forms a considerable proportion of the total own revenue. The growing urbanisation in these districts implies that the value of residential premises has been growing, and thereby better opportunities for GPs to revise and impose house tax. Similarly, rising incomes enable the rural dwellers to construct new and better houses and go for amenities such as private household water connections. This, in turn, leads to higher potential for GPs to mobilise own revenue in the form of water user charges. The booming construction industry in Bangalore city provided an opportunity for GPs in the Bangalore hinterland to raise revenue from the sale of sand, auctioning of granite, etc. Thus, these two districts are distinctly different in so far as the mobilisation of own revenue is concerned. As a result, the per capita own revenue was high at around ₹135 while it did not cross ₹ 20 in most of the districts in 2002-03 (Rajasekhar and Manjula 2010).

Nevertheless the high per capita own revenue has not led to a reduction of ratio of expenditure on streetlight services in these districts because of the weak accountability. In these districts, the construction of houses in revenue land makes the owners to be proactive in the house tax payment with the hope that such payment will provide legal legitimacy to the house ownership. Such an active involvement in the payment of house tax may not be visible when it comes to raising voices on services provided by GPs.

The results show that the variable on fixation of meters is not statistically significant at the State level and in highly developed, developed and backward districts. However, the statistically significant results in the highly backward districts suggest that if a meter is fixed, this would reduce the expenditure by 20 paise for every one rupee (or by about 20 per cent). This is because the calculations of electricity charges are likely to be accurate in the case of GPs that have installed meters. The notional method adopted by KPTCL is likely to result in higher electricity charges, as this method does not take erratic power supply, non-functioning streetlights, etc., into account. The installation of meters will, thus, lead to the correct reading of the electricity consumed, lower expenditure on electricity and better affordability of GPs.

Sex of the president is significantly associated with the ratio in the backward category of districts. In these districts, the ratio declines by 8 per cent wherever a GP has woman president. In other words, if the GP has female president then the ratio will decrease by 8 paise as the females are known to have more social concern (Chattopadhyay and Duflo 2004).

Age will negatively influence the ratio, as older people would have acquired considerable experience on managing the

resources. In other words, higher the age of GP president lower is the ratio. This has been found to be the case in the backward category of districts.

### Conclusions and Policy Suggestions

In the context of inadequate fiscal decentralisation in Karnataka, two questions are raised in this paper. Can GPs afford provision of streetlight services? What factors determine the affordability of streetlight services by GPs? These questions are analysed with the help of the data (pertaining to 2002-03) collected from 5,212 GPs out of 5,665 GPs in Karnataka. We conclude that GPs are not able to operate and maintain streetlight services. The ratio of expenditure to one rupee of revenue varied from as low as ₹ 0.61 to as high as ₹ 6,661. On an average, each GP spent ₹ 104 for every rupee of receipt. Important factors determining the affordability of streetlight services are the number of households per streetlight, per capita grants to GPs and per capita own revenue. In the ensuing paragraphs, we provide policy suggestions based on the analysis carried out in the paper.

*GPs should follow the official norm on the coverage of households per installed streetlight* : The highly significant negative relationship between number of households per each installed streetlight and the ratio in the State and as well as across different categories of districts implies that a reduction of one household per every installed streetlight reduces the expenditure by 1-4 paise per every rupee of receipts. We do not, however, suggest the norm of providing one streetlight for 7-10 households is to be reviewed. What we suggest is that this norm should be strictly followed, and there is need to impress upon GPs that they do not succumb the pressure to install one streetlight for less than seven households. Second, the coverage was inadequate in over

17 per cent of GPs and grossly inadequate in about 3 per cent of GPs (Chart 1). Most of these GPs are located in hilly districts where large number of hamlets together with their scattered location makes it difficult to provide streetlight services. In the case of these GPs, financial assistance to install and manage solar streetlights is to be provided.

*Create a Congenial Incentive Structure* : The regression results show that an increase in the per capita total grants leads to an increase in the ratio of expenditure to receipts, and a decline in the affordability of GPs. As devolution of the grants to GPs does not take place on the basis of performance of the GP, an inference that can be drawn is that allocation of grants without taking performance of GP into account proved to be less incentive for better performing GPs. This results in inefficient use of the grants for developmental works and in less downward accountability.

It has been found that larger the own revenue mobilised by GPs, lesser the expenditure on streetlights and better is the affordability of GPs. Creating a congenial incentive structure to promote the mobilisation of own revenue (which does not unduly compromise with equity) is, therefore, essential. If the grants are linked with the performance of gram panchayats, this can act as an incentive for gram panchayats to make an efficient use of these grants.

*Fix Meters to Record Actual Electricity Consumption* : Only a small proportion of the GPs in the State had fixed the meters to monitor electricity charges. In the absence of the meter, electricity charges were arrived at on the notional basis rather than on actual basis by KPTCL. This resulted in huge electricity bills for GPs. In order to curb this faulty procedure, the department of Rural Development and Panchayat Raj had entered into an understanding with KPTCL that it

should fix meters in all GPs before February 2004. This was subsequently formalised in an official circular (No.RDP 1 KPTCL 2004) dated 25/10/2004. If meters are fixed in GPs and they are properly monitored, GPs will then become aware of the magnitude of expenditure on streetlight services, and take corrective measures. Since fixation of meter reduces expenditure and improves affordability, there is a need to give serious attention to the fixation of metres in all GPs.

*Introduce Centralised Switching on or Off System :* Expenditure on maintenance is another area for improvement. Maintenance charges on account of replacement of bulbs have been reportedly high on account of fluctuation in power supply, breaking of bulbs by miscreants, etc. Another reason reported for high maintenance charges has been lack of system for centralised switching on and off of streetlights. In GPs, where habitations are large in number and spread out over a vast area, lack of centralised system has resulted in non-switching of streetlights, and hence, frequent damage to bulbs. This resulted in increase in both maintenance expenditure and electricity charges.

*Use Low Energy Consuming Bulbs :* Another area of concern is usage of high energy consuming bulbs for streetlights. Instead of mercury bulbs and sky lamps, usage of florescent tube lights for streetlights is well suited because of its long durability and less consumption of electricity, as electricity and maintenance costs would become high in the case of former. GPs should also use Solar

Voltaic/ Lighting for streetlights. This is because although installation charges are high, electricity and maintenance charges would be very minimal. Further, they are highly suited to GPs with scattered habitations. These measures will reduce expenditure on electricity and improve affordability.

*Review the Current Policy of Rotation of GP Presidents :* Another important finding from the paper is that if a woman heads GP, there would be reduction in expenditure on streetlights. This suggests that the GPs headed by women tend to be efficient. The policy implication is, therefore, to provide more encouragement to women to contest for GP executive positions, and review the current policy of rotation of GP presidents once in 20 months.

To conclude, notwithstanding that the gram panchayats in Karnataka are provided with some untied grant, their expenditure autonomy relating to development is eroded due to high expenditure on the provision of services such as streetlights. A direct consequence of non-affordability in the case of a majority of GPs in the provision of streetlight services is that untied grants are not utilised for activities that would improve the employment and growth potential in the GP jurisdiction. Policy initiatives along the lines suggested in this paper are needed to improve the affordability of GPs in the streetlight provision and reduce the utilisation of untied funds for the service provision.

### Notes

- 1 While there is considerable literature on rural electrification (Pillai 1981; Paliwal 1985; Rajasekhar *et al* 2010), community lighting received a passing mention in the studies on regional (GoK 2002b) and rural-urban disparities (Songco 2002).
- 2 With the establishment of the Rural Electrification Corporation in 1969, finances to fund and accelerate rural electrification schemes became available to all state governments.

- 3 The activities of assisting the poor and households belonging to scheduled caste/ scheduled tribe/ other backward caste in obtaining power connection under various programmes, and monitoring and reporting progress of energisation of irrigation pumpsets are assigned to Taluk Panchayat.
- 4 This database was built as part of the study on 'Managing and Disseminating Panchayat Data for Furthering Decentralisation Reforms' undertaken by the Centre for Decentralisation and Development (CDD) in collaboration with the Department of Rural Development and Panchayat Raj (RDPR), GoK. Since this was a collaborative study with the government, the research team was able to access documents such as audit reports, bank passbooks, and other records like demand, collection and balance register, etc, for the purpose of cross-checking of the data.
- 5 The analysis pertains to 27 districts as existed in 2002-03.
- 6 The same was noted by the High Power Committee on Redressal of Regional Imbalances. The Committee found that only 37.5 per cent of the hamlets in the State were provided with streetlights and these were concentrated in Malnad and Coastal districts of Karnataka (GoK 2002b).
- 7 The following may be noted. Although the government provides annual untied grant to each GP and Section 206 of Panchayat Raj Act allows GPs to use this for the payment of electricity bills, these statutory untied grants are not included as one of the receipts of GPs to work the affordability ratio. This is because these untied grants would be utilised not only for electricity charges but also for the maintenance of water supply schemes, sanitation and other welfare activities, and it is difficult to apportion the grants that were exclusively used to pay electricity charges towards provision of streetlight services.
- 8 This included electricity charges for water supply and office maintenance as well. In some of the districts, there were deductions for even the expenditure incurred on anganwadi centres. So much is the problem of deductions at the source that a few GPs did not receive anything from the statutory grant in 2002-03.
- 9 See Rajasekhar and Manjula (2011) for more details.
- 10 It needs to be noted that many GPs do not explicitly state that they are collecting light cess as a part of house tax. They do not even provide separate figures on the amount collected as light cess when it comes to reporting to higher authorities. We have, however, tried to overcome this by taking ₹ 5 per household as notional figure in our calculations to work out the total receipts.
- 11 Statutory untied grant of ₹ 3 lakh per GP was the only general-purpose grant in 2002-03. Specific purpose grants included those provided under various programmes such as SGRY and Nirmala Grama Yojana. The other grants coming under this category are Finance Commission Grants, Development Grants, Water Supply Grants and other grants.

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