
ABSTRACT

Light and arrangement for getting is these days a dynamic phenomenon. The efficiency, efficacy and need for power preservation at one end and waste management at other end are the prime concerns these days. The efficacy improvements have arrived from different types of technologies arrived at. The latest are the LED ones. These require most precious metals and when these bulbs become useless they need to be disposed. The disposal and effects due to this can be seen in varied order. The study reveals that the reuse and minor repairs can save money and material and we can get rid of material losses.

Keywords: *Light, Luminance, Incandescent, CFL, LED, Disposal, End-of-life, Mercury, Disposal Hazards.*

INTRODUCTION

Growth mankind and need for elongation of working duration is based on the availability of light. Natural source of light in universe is sun which varies as per position of residence on the globe of individual. Growth and technology advancement initiated the quest for many things. Starting from fire, fire work as means of light we turned to oil and gas lamp arrangements for lighting, which since 1900 turned to incandescent lamps.

Power shortage and fact that only 1-3 percent of electricity consumed into usable light lead to stress for development of efficient means of consumption of electricity in lighting. The excessive consumption and scope of saving power for innovation, research and other industrial uses need massive efforts were put in and resulted to development of conventional Florescent Tube light (FTL), Compact Florescent light (CFL) and Light Emitting Diode (LED) light arrangements.

Whatever small quantity these lamps produce on disposal, these have to be taken care of. The present paper and study mainly focus on the issues of analyzing the different technologies adopted and practiced by the residents of the most educated city of India.

PRESENT STUDY REGARDING LAMPS USE STATUS & DISPOSAL IN BANGALURU

Bangaluru though metro city but if we look all round it has well diversified area having mix of urban and semi urban populations. The area was divided in ten groups for our study. 100 questioners in each cluster equally divided among urban and semi urban area were circulated and collected. An average family consisting 5 members in has been. The questionire were distributed and collected. The collected samples shows incandescent lamp, FL and LED lamps are calculated. Taking average life of incandescent lamp as 1 year 2.5 years for CFL and 10 years for LED one interesting results. This sample will suggest getting the trend of electronic waste being generated.

The data and information gathered by the survey has been tabulated in table 1 and table 2. Graphical presentations of the various factors for the individual regions have been put forth from figure1 to 7.

Table 1

Regions of Bangaluru	Sample size	Details received from	Lamps in Use				Awareness of hazard / constituents	Disposal Methods adopted			EPR awareness
			Inn d	HI L	CF L	LE D		Thro w	Se ll	Agen cy	
Region 1	100	84	56	32	52	19	47	56	6	5	45
Region 2	100	68	59	8	59	34	14	62	4	1	12
Region 3	100	66	48	6	59	27	21	57	2	4	23
Region 4	100	59	42	2	46	72	22	48	6	5	16
Region 5	100	71	36	18	39	25	18	63	4	6	32
Region 6	100	48	41	3	32	23	13	43	3	1	19
Region 7	100	61	43	7	46	18	23	47	4	6	17
Region 8	100	57	45	3	61	27	37	53	4	7	24
Region 9	100	85	48	23	59	29	29	65	18	4	21
Region 10	100	81	41	18	56	26	26	56	18	4	18

Figure 1 shows the required i.e. sample size selection to response outcome. The best responses are from the industrial regions and the least are from the relatively low industrial and backward regions. The commercial applications are also in semi domestic nature in such regions.

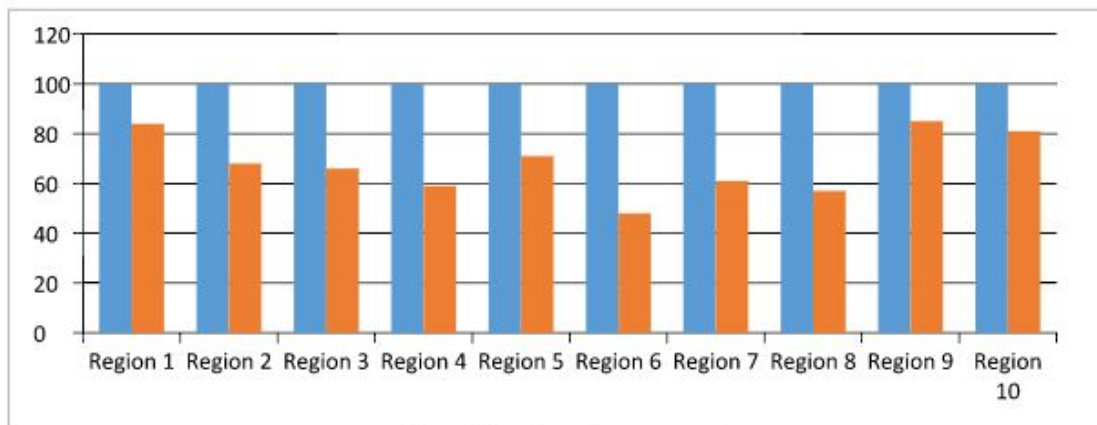


Figure 1 Sample vs Response graph

Figure 2 represents the uses of different types of lamps. Conventional lamps mainly because of cost factor are most popular in use. Least number of LED despite of very long life and efficiency and efficacy find less use. Mostly these are in the commercial establishments only as tariff is also very in such cases. Public in general is very less know about the hazards and often handle these lamps in idea of physical damages only. The toxic and hazardous content knowhow is very limited. In general normal citizens are ignorant about other constituents in the lamps.

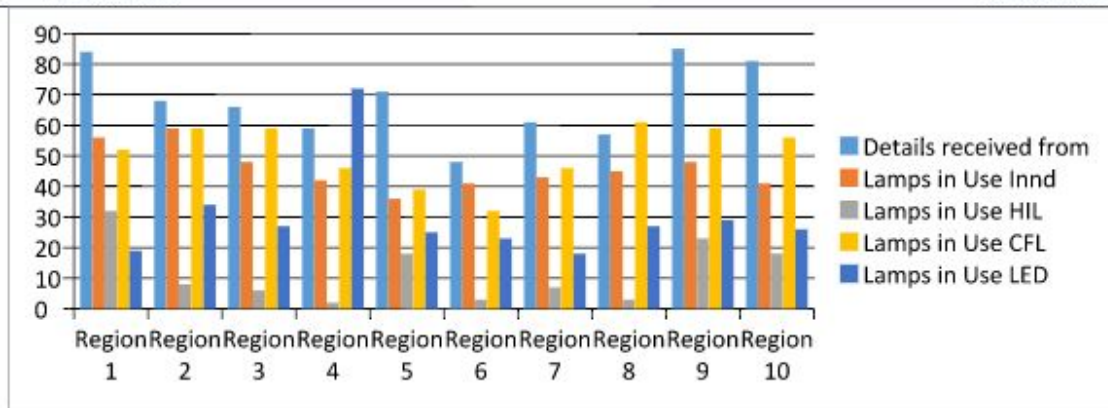


Figure 2 Lamps in Use

Next graphical representation figure 3 depicts about the tendency of general public about disposal. The graph is mainly for the receipt of feedbacks and the level of awareness of hazards present in the lamps when they are disposed. The level of awareness is low. The education level mainly sees the variation in the responses.

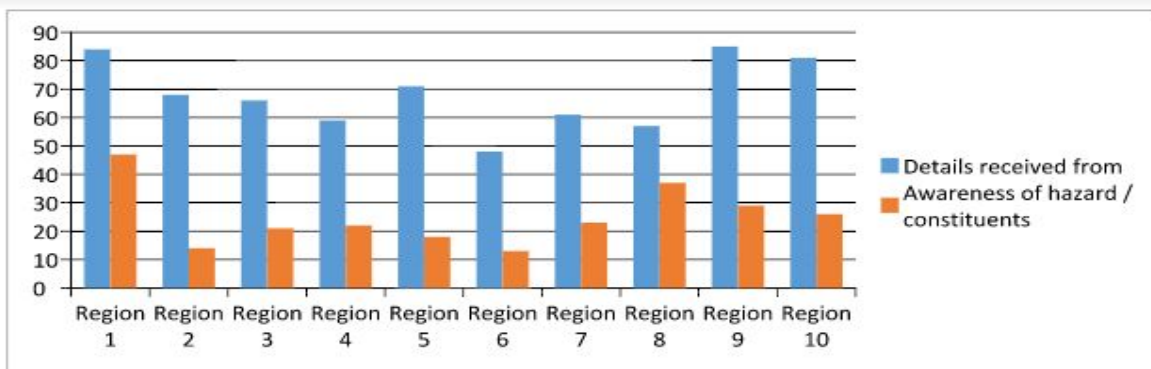


Figure 3 Sample vs Awareness Graph

Graphical representation in figure 4 shows the details and tendency of disposal methods. The persons throwing disregarding the danger which will arise is alarmingly high. Even capital gain from the discarded ones is also low. In semi urban areas where inflow of money is limited the tendency has gained significant order. The affluent areas and the ignorant area is well evident for the adopted agency one.

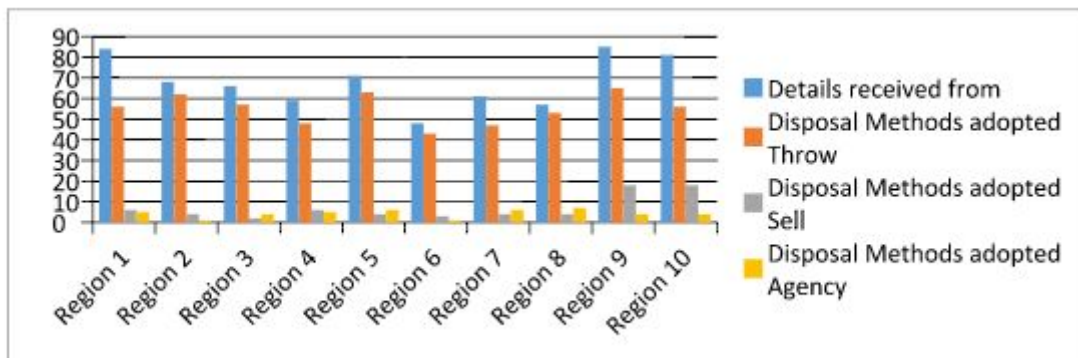


Figure 4 Sample vs Disposal Methods

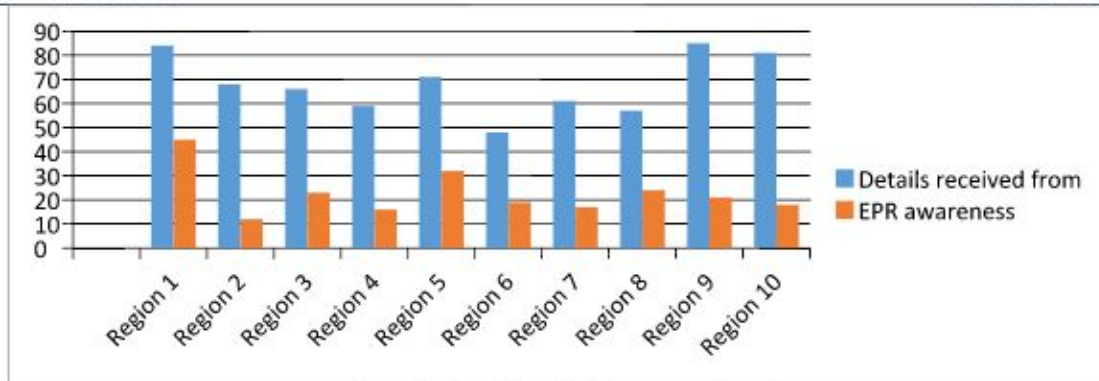


Figure 5 Sample vs EPR awareness Graph

Graphical presented in figure 5 shows the awareness level of EPR. It is significantly low in semi urban or rural area. The awareness is proportional to level of posity or education.

Table 2

Region of Bangaluru	If Govt. / free provided will use CFL/ LED	Improv ed light by CFL/ LED use	Reducti on in Elect Bill after CFL/ LED in %	Warranty/ buyback considerat ion for CFL/LED use	CF L /LE D cost for non use	Ready to even pay for hazard reducti on	Hardl y matte rs	Get CFL repair ed	Awa re of elect savin g	Interest ed to know more
Region 1	24	73	23	63	64	23	8	12	64	54
Region 2	38	65	21	55	58	25	5	11	48	38
Region 3	26	62	18	61	56	21	9	14	46	36
Region 4	29	57	15	52	49	12	11	1	39	39
Region 5	31	68	26	61	61	21	13	1	41	21
Region 6	18	39	26	29	38	19	10	2	28	38
Region 7	31	56	21	50	41	20	6	4	41	31
Region 8	37	53	22	43	47	13	8	2	37	37
Region 9	35	81	24	51	65	11	9	11	25	35
Region 10	31	76	21	56	61	16	4	5	21	31

Details of variotions of provision of lamps , importance of luminance resulting from various sources of lamps , due to replacement of lamps effective reduction in electric bills which may be seen as direct incentive has been dealt in figure 4. The to the user , effect of warranty or take back on investment and consideration of cost and other factors have been studied. The data collected suggest that general awareness about luminance prevails, bill reduction plays important role in changes but at same time the inaction among the consumers is prevelant which is reducing the pace of changes in eite group who rarely feels about cost at same time there is a sizable section for whom cost is a real factor for ot going towards this change.

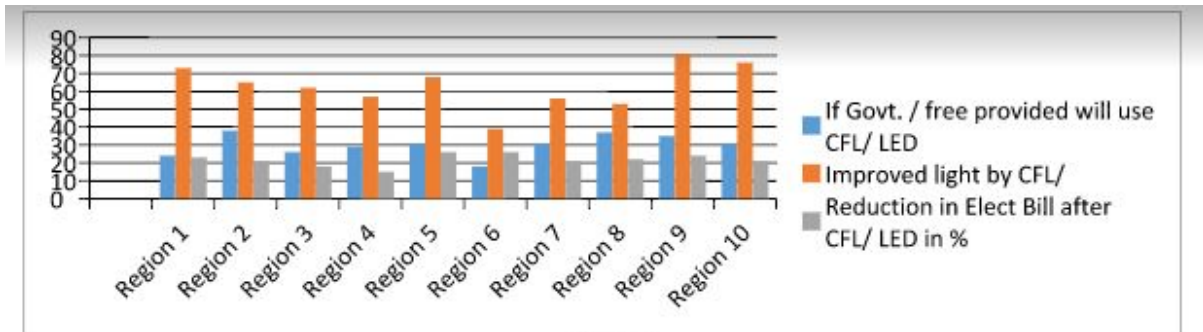


Figure 6

Graphical in figure 6 shows the trend and tendency of consumer or users for awareness for environment in terms of their readiness even to take the burden of cost for collection by the manufacturer of the local authorities. Free provision from agencies will attract most of the persons to avail the benefit. The cost consideration is perhaps the region for this. A good sizable section i.e. most of the persons sees the improvement in light an option for going to the CFL. Reduction in Electricity Bills i.e. Saving of power and in turn money is also well evident in almost all the regions

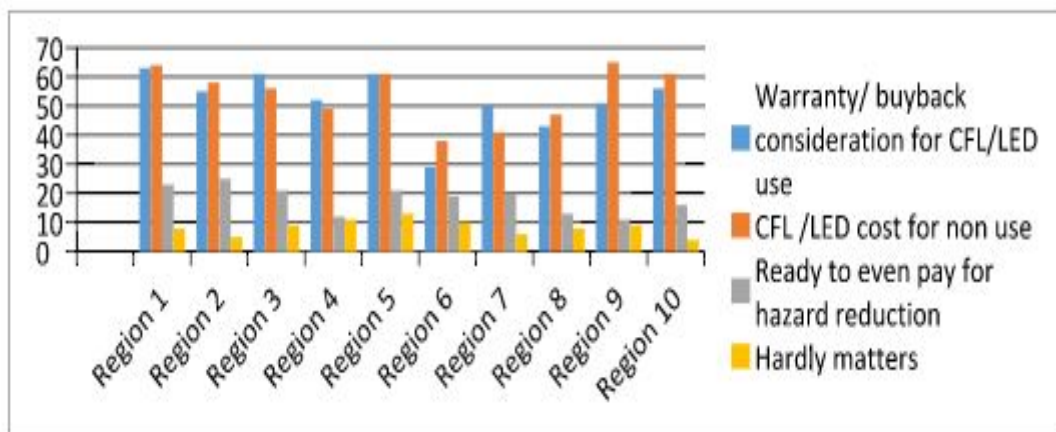


Figure 7

Figure 7 shows the warranty / buyback consideration of costly bulbs to considerable level. The CFL / LED cost for non use is highest. A sizable section is even willing to pay for hazard reduction also. As usual the tendency of ignorance is also seen in almost all regions which we have considered as hardly matters in this study.

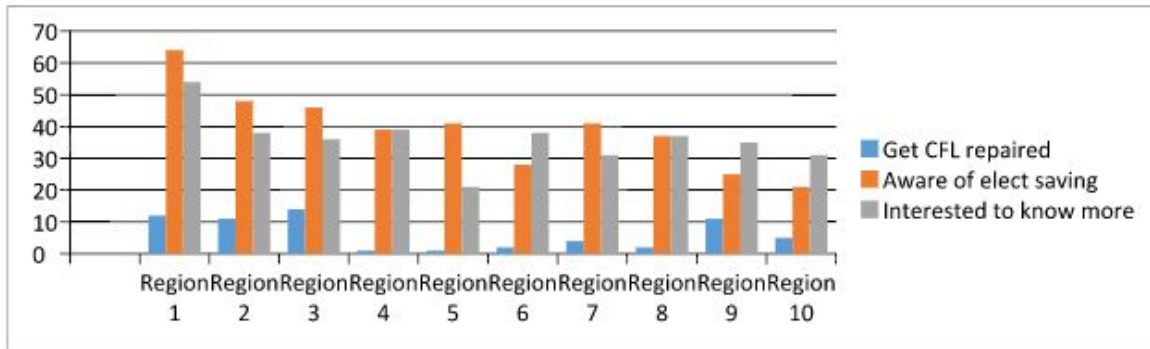


Figure 8

Figure 8 has graphical representation for three studies. The first one is for in case if the CFL /LED i.e. costlier lamps get fused, persons even prefer to get it repaired. The size is very low but still section opting this is present.

Awareness of possibility of saving is a good driving force among the population and the fairly good number of responders have expressed their views in its favour.

As usual the tendency for showing the interest to know more and more is always seen in survey, is evident here also.

CONCLUSION

Lighting sources play an important role in power consumption and the choice of lamps largely decides the electricity bills and the amount and quality of wastes we are generating from these. These days Around 18 to 20 % power is consumed for lighting purpose. Saving of power from this section can be achieved by making use of relatively new products like CFL, LED lamps etc. The CFL and LED life span and efficiency compared to incandescent lamps and over other in order is of main consideration. The disposal of florescent lamps increases the level of mercury and other hazardous materials which find use in CFL and LED lamps has to be adjusted and minimization of these should be taken with utmost speed. The HIL are still major concerns as mercury levels are between 50 mg to 1000 mg in each unit depending on its wattage.

The end of life i.e. disposal of these have been neglected till date. Mechanism of manufacturer's involvement by EPR and buy back facilities has to be made available for safe and technological disposal of such hazardous / toxic substance containing lamps. At present nearly 90 % lamps find place in local dustbins as users throw these. 95 % population doesn't know the constituents of lamps. In case of collection in the present scenario it is collected by the door to door collectors who hand over to small traders, from here it moves to traders who send the wastes to refurbisher or recycler. The refurbisher repairs lamps and resend to traders for sale and reuse. Dismantlers / recyclers takeout the electronic components from the PCB as per status are resend for reuse or recovery. After maximum recovery left out wastes are technologically land filled or settled.

Electric power shortage is major problem so steps for reduction of consumption is need and smart move. This can be achieved from increasing lumen capacity of the lamps with aim on reducing power consumption by shifting to more efficient and higher efficacy lamps. Reduction upto 80 % power requirement can be achieved. Lack of awareness and increased cost of CFL and very high cost of LED lamps needs a look from the governmental side. The main cost factor is responsible for low use of LED bulbs. The provision of subsidy can solve this problem.

Strict EPR initiatives and development of framework for safe disposal of wastes for reduction in hardness and adherence to existing regulations and enactment of new needed acts i.e. regulations to fill gaps of the current ones should be taken up with utmost priority to do away the hardness and reduce the toxicity in environment. Condition of Bangaluru is no different from less developed areas or places. The diversified areas of the locality show very little deviations. Pattern is same

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