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SOCIO-ECONOMIC BACKGROUND AND USE OF LATRINE IN RURAL INDIA: AN IN-DEPTH ANALYSIS

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ABSTRACT

As a fitting tribute to Mahatma Gandhi on his 150th birth anniversary, India has set a target of making all gram panchayats 'Open Defecation Free' by the year 2019 under the 'Swachh Bharat Initiative'. Exclusive information/ analysis on use of latrine and various socio-economic factors influencing the use of latrine in rural India is required for having a sound policy framework. In view of this an attempt has been made to study the influence of socio-economic factors like social group, religion, gender of head of households, highest level of education among female and male members of households, family size and occupation of the households on the probability of use of latrine by the households. In this study binary logistic regression technique has been applied on the unit level data of survey on "Drinking Water, Sanitation, Hygiene and Housing Condition" in India conducted by National Sample Survey Office (NSSO), Government of India, during July, 2012 to December, 2012. The study reveals that the selected socio-economic factors (except gender of head of households) do have a significant impact on the probability of use of latrine of the households in rural India.

Introduction

Access to sanitation facilities is one of the most pressing contemporary global development issues. With an estimated 36 per cent of the global population lacking access to safe sanitation, of which 70 per cent living in rural areas, and 14 per cent of global population still defecating in the open, sanitation remains a major public health concern for all the governments (WHO-

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UNICEF, 2014). Consequently, it has been widely established that poor sanitation and practice of open defecation has disastrous impacts on the health of an individual and on the economies at a larger scale. The Water and Sanitation Programme of the World Bank estimates that a lack of sanitation costs India US$48 per person per year, the equivalent of 6.4 per cent of the country's gross domestic product (WSP, 2010). The situation is particularly acute in India where more than half of households do not have a latrine facility within the premises with the percentage being as high as 69.3 per cent in rural areas and 18.6 per cent in urban areas (Census, 2011). As per WHO-UNICEF estimates, India continues to be the country with the highest number of people defecating in open and more than half of the global population who defecate in open live in India. In rural areas, the proportion of people defecating in open even is higher at 66 per cent (WHO-UNICEF, 2014). Thus, eliminating open defecation, which is strongly associated with poverty and exclusion, is critical to reduce the disease burden thereby leading to better productivity and well-being of the poor/ excluded.

Research has consistently demonstrated the nature of links between access to sanitation and the role of public policy, achievements in other capabilities such as health, education, etc. Interestingly, it is realised that key dependency exists between water supply and sanitation and improvements in the overall human development (Dreze and Murthi, 2001) and absence of quality sanitation has adverse impact on health, especially to the child population (Spears, 2013). Recognising it as a basic human right, United Nations Development Programme (UNDP) has called for 'universal access to the basic social services (including sanitation and water)' as one of the pre-requisites to ensure 'A Life of Dignity for All' (HDR, 2014). This implies that universal sanitation coverage is an imperative for India.

With a number of interventions, Government of India has been laying special emphasis on achieving universal sanitation coverage (MDWS, 2014). As per the statistics presented in budget document 2015-16, 50 lakh (5 million) toilets have already been constructed since the launch of Swachh Bharat Mission (SBM) in 2014 (FM Budget Speech 2015-16). Although, there has been an improvement in the proportion of households having latrine facilities, the existing level of deprivation of the households is very high and varies widely from rural (69.3 per cent) to urban areas (18.6 per cent). Therefore, despite having a strong policy framework, sanitation in both the sectors (especially in rural areas with 116.3 million households) requires an immediate attention.

India is a diverse country with various socio-economic factors varying from one corner to another corner. Apart from access to latrines, the socio-economic factors

especially religion, occupation, level of education, household size, gender, etc. , are also likely to play a major role as far as use of latrine is concerned. In this direction, this paper is an attempt to study the impact of socio-economic factors on usage of a latrine, for rural sector.Socio-economic factors such as level of education, occupation, household size, social group, religion, etc., have been studied in respect of their deterministic character on usage of the latrine. An attempt to pen down the policy framework on sanitation in India has also been endeavoured.

Policy Framework on Sanitation in Rural India: An Overview

Government of India had introduced rural sanitation programme in the year 1954 as apart of first Five Year Plan. Focussed attention on rural sanitation began during 1981 – 90, when India participated in the international decade for drinking water and sanitation and declared to set up a national level apex committee to define policies for the sector. With the objective of improving the quality of life of the rural people and to provide privacy and dignity to women, the Central Rural Sanitation Programme was started in 1986 to extend the sanitation facilities in rural areas of the country. The programme was a 'supply-driven and infrastructure-oriented programme' for latrine construction.

Due to slow growth in rural sanitation coverage, Central Rural Sanitation Programme was re-oriented, from a supply-driven to demand-driven programme and in turn to Total Sanitation Campaign (TSC) with effect from the year 1999. The year 1999 can be seen as another landmark year for the sector with the formation of a separate Department of Drinking Water Supply in the Ministry of Rural Development. To generate awareness on sanitation and to add vigour to TSC, the Nirmal Gram Puraskars were started in the year 2003 which recognise the achievements and efforts made at the Gram Panchayat level in ensuring full sanitation coverage and achieving other indicators outlined for 'Open defecation free gram panchayats'.

The year 2010 was another milestone in the history of water and sanitation policies in India. During this year, the Department of Drinking Water Supply was renamed as Department of Drinking Water and Sanitation and in 2011,it was conferred the status of a Ministry for greater focus and functional efficiency. At present the Ministry of Drinking Water and Sanitation is the nodal agency for the overall policy, planning, funding and coordination of programmes for both drinking water and sanitation in the country.

For realising the vision of government of achieving 'Nirmal Bharat' by 2022, a Rural Sanitation and Hygiene Strategy has been formulated for the period 2012 to 2022. Encouraged by the success of Nirmal Gram Puraskars, the TSC has been revamped as "Nirmal Bharat Abhiyan"and launched from 2012. This programme is aimed to be a

successor programme of the TSC and its main emphasis is on accelerating the sanitation coverage in the rural areas so as to comprehensively cover the rural community through renewed strategies and saturation approach.

To accelerate and consolidate the efforts towards universal sanitation, Swachh Bharat Mission was launched on 2nd October, 2014 as a combination of two Sub-Missions, Swachh Bharat Mission (Gramin) and Swachh Bharat Mission (Urban). The Swachh Bharat Mission aims to achieve Swachh Bharat by 2019, as a fitting tribute to the 150th Birth Anniversary of Mahatma Gandhi. In rural areas, creation of a Swachh Bharat means improving the levels of cleanliness in rural areas through solid and liquid waste management activities and making gram panchayats open defecation free, clean and sanitised.

Methodology

Objective: Access to proper sanitation facilities is a basic requirement of human well-being. Amongst Sanitation facilities, usage of latrines is especially known to affect the health and hygiene of the population. An in-depth study about the availability and use of latrine at the micro-level and various socio-economic factors affecting the incidence of use of latrine is the need of the hour. The objective of this paper is to study the influence of socio-economic factors like social group, religion, gender of head of household, highest level of education among female and male members of household, family size and occupation of the households on the probability of use of latrine by the households in Rural India. Unit level data from National Sample Survey (NSS) 69th Round (July, 2012 – December, 2012) on "Drinking Water, Sanitation, Hygiene and Housing Condition" in India and the technique of binary logistic regression have been used for this study. Certain policy suggestions have also been made depending upon the findings of the study.

Data Source: For the sound policy framework on sanitation, exclusive information on use of latrine is required. In view of above, NSSO undertook a specialised all-India survey on "Drinking Water, Sanitation, Hygiene and Housing Condition"in its 69th Round conducted during July, 2012 to December, 2012. In this survey information was collected on access to latrine, in terms of exclusive use, common use or no access, type of latrine and reason for not using latrine despite having access at household level for different social, occupational and educational classes and religious groups. This study is based on the unit level data of this survey.

The survey was conducted amongst a representative sample of households selected randomly covering almost the entire geographical area of the country. A stratified multi-stage design was adopted for the survey. First stage units being the 2001 population Census villages (panchayat wards in case of Kerala) in the rural sector and the ultimate stage units were the households. A

sample of 53,393 rural households, spread over 4475 villages was surveyed.

The most appropriate statistical analysis technique to describe the functional relationship between a dependent variable and a set of independent variables is the Regression Analysis. However, when dependent variable is categorical and qualitative in nature, Logistic Regression technique is used to establish the functional relationship between a dependent variable and a set of independent variables. When the dependent variable has two categories, the Binary Logistic Regression technique and when the number of categories is more than two, Multinomial Logistic Regression technique is used.

In this study "Use of Latrine" has been taken as a dependent variable and social group, religion, gender of head of households, highest level of education among female and male members of households, family size and occupation of the households has been taken as an independent variable.Since dependent variable is qualitative variable with binary outcomes, which can be coded as one or zero depending upon latrine use and latrine non-use by households, a Binary Logistic Regression Analysis has been carried out. The independent variables are categorical in nature and for each independent variable, one category is selected as a reference category and comparisons are made between other categories of independent variable with respect to the reference category.

The probability of "Use of Latrine" of a household 'P' can be expressed using the following equation:

$$P = \frac{1}{1+\exp\left\{-\left(b_0 + b_1X_1 + b_2X_2 + \ldots + b_7X_7\right)\right\}}$$

where X_1 , X_2 ,……., X_7 are independent variables related to social group, religion, gender of head of households, highest level of education among female and male members of households, family size and occupation of the households respectively and b_1 , b_2 ,……., b_7 are logistic regression coefficients corresponding to the independent variables.

The equation can be expressed in the following form also:

$$1 - P = \frac{\exp\left\{-\left(b_0 + b_1X_1 + b_2X_2 + \ldots + b_7X_7\right)\right\}}{1 + \exp\left\{-\left(b_0 + b_1X_1 + b_2X_2 + \ldots + b_7X_7\right)\right\}}$$

$$\frac{P}{1-P} = \frac{1}{\exp\left\{-\left(b_0 + b_1X_1 + b_2X_2 + \ldots + b_7X_7\right)\right\}}$$

$$\log\left(\frac{P}{1-P}\right) = b_0 + b_1X_1 + b_2X_2 + \ldots + b_7X_7$$

L.H.S. of the equation is log odds of use of latrine of household and is known as logit of P.

To test the significance of each independent variable Wald statistic has been computed at 95 per cent level of significance. Wald Statistics is the ratio of the Logistic Regression Coefficient to its Standard error i.e. Wald Statistics = b\SE (b).

Findings and Discussion

The findings of the paper have been discussed in two sub-sections, which follow. In the first sub-section, the descriptive analysis on the use of latrine has been done in respect to characteristics of the households: social group, religion, gender of head, highest level of education among female and male members, family size and occupation. A detailed econometric analysis has been done in the second sub-section.

Descriptive Analysis: Table one gives percentage breakup of households in rural India belonging to different categories of the independent variables on the basis of their usage or non-usage of latrine. It can be seen that more than 50 per cent of households belonging to social groups Scheduled Tribe, Scheduled Caste and Other Backward Castes are not using latrines, however, the condition of 'Other Castes' is relatively better, as only less than 40 per cent households are not using latrines. Among the social groups, the highest percentage of households using latrines belong to 'Other Castes' followed by Other Backward Castes and the highest percentage of households not using latrines belong to Scheduled Tribe followed by Scheduled Caste. For the independent variable of religion, it is observed that the majority of Sikh and Christian households are using latrines in rural India. More than half of Muslim households and less than half of Hindu and Buddhist households are using latrine.

The gender of head of household is found to have no impact on the preference of use of latrines as the percentage of male headed households using latrines is almost the same as that of the female headed households. It may be observed that use of latrine is lowest for those households where members are illiterate and increases with the increase in level of education of the members. It is also noticeable that in households, where female members are illiterate, only 19.7 per cent of the households were using latrines and this percentage went up to 33.4 for the households where at least one female member was having primary level education. On a similar pattern, it can be observed that for the households where male members are illiterate, only 17.9 per cent households were using latrines and for the households where male members are having primary level of education percentage using latrines went up to 29.6.

Table 1: Percentage of Households Using and Not Using Latrine in Rural India

Independent Variable	Categories of Independent Variables	Latrine not used	Latrine used
Independent Variable	Categories of Independent Variables	Latrine not used	Latrine used
Social group	Scheduled Tribe	76.2	23.8
	Scheduled Caste	71.7	28.3
	Other Backward Castes	63.7	36.3
	Others	35.2	64.8
Religion	Hindu	63.8	36.2
	Muslim	44.1	55.9
	Christian	24.6	75.4
	Sikhs	19.8	80.2
	Buddhist	55.4	44.6
	Others including Jain	71.4	28.6
Gender of head of	Male	60.4	39.6
households	Female	57.4	42.6
Highest level of education	Illiterate	80.3	19.7
among the female	Primary level	66.6	33.4
members of households	Upper primary level	56.2	43.8
	Secondary and higher secondary level	41.3	58.7
	Graduate and above	20.2	79.8
	Others	48.5	51.5
Highest level of education	Illiterate	82.1	17.9
among the male members	Primary level	70.4	29.6
of households	Upper primary level	64.8	35.2
	Secondary and higher secondary level	50.3	49.7
	Graduate and above	27.4	72.6
	Others	55.1	44.9

(Contd...)

Table 1 *(Contd...)*

Independent Variable	Categories of Independent Variables	Latrine not used	Latrine used
Family size	Less than and equal to three	58.2	41.8
	More than three but less than and equal to five	59.0	41.0
	More than five but less than and equal to seven	63.5	36.5
	More than seven	62.4	37.6
Occupation of the households	Self-employed in agriculture	62.9	37.1
	Self-employed in non-agriculture	46.0	54.0
	Regular wage and salary earning	34.4	65.6
	Casual labour in agriculture	79.9	20.1
	Casual labour in non-agriculture	70.2	29.8
	Others labour	45.5	54.5

The bivariate table also reveals that the use of latrine is highest for those households, where highest level of education of female and male members of households is graduate level and above.

The percentage of households using or not using latrine in rural India, according to household size and occupational status of head of the households is also given in Table 1. It may be observed that more than 50 per cent households are not using latrines irrespective of the household size or occupational status though this percentage varies for the households belonging to different categories. The highest percentage (41.8) of households using latrine had a size less than three and lowest percentage (36.5) of households had a size more than five but less than and equal to seven. In case of occupation, the highest percentage (65.6) of use of latrine was observed amongst those households where head of households is regular wage and salary earning.

Econometric Analysis: Theresults of binary logistic regression analysis on "Use of Latrine" of the households for different categories of independent variables are shown in Table 2. The 1st column B gives the estimates of binary logistic regression coefficients and the 2nd column gives their standard errors. Wald statistics for testing the significance of individual variables has been computed in column 3. Degree of freedom (df) of the Wald statistics and its significance is given in columns 4 and 5. The last column depicts the odds ratio, i.e. the magnitude of odds of use of latrine of the households belonging to any category as compared to the reference category

for a given individual variable. On application of Wald statistic for testing the significance of each category of the independent variables, the regression coefficients associated with most of the categories of the independent variables are found to be significant. Those regression coefficients which are non - significant in their effect on the dependent variable have been marked with * sign and no inference has been drawn for these categories. The main findings, for different independent variables, are discussed in this section.

Table 2 : Estimated Logistic Regression Coefficients and Odds Ratio

	B	S.E.	Wald	df	Sig.	Exp(B) (Odds Ratio)
Social group (® Others)			1157	3	0.000	
Scheduled Tribe	-0.624	0.038	275.584	1	0.000	0.536
Scheduled Caste	-0.986	0.034	842.996	1	0.000	0.373
Other Backward Castes	-0.814	0.027	929.617	1	0.000	0.443
Religion (® Hindu)			2963	5	0.000	
Islam	0.944	0.034	793.261	1	0.000	2.571
Christianity	2.519	0.065	1523	1	0.000	12.411
Sikhism	2.087	0.088	556.765	1	0.000	8.06
Buddhism	1.605	0.1	255.032	1	0.000	4.977
Others including Jainism	1.333	0.111	144.463	1	0.000	3.792
Gender of head of households (® Male)*	0.043	0.036	1.417	1	0.234	1.044
Highest level of Education among the female member of households (Illiterate)			2168	5	0.000	
Primary level	0.79	0.033	577.289	1	0.000	2.204
Upper primary level	1.129	0.034	1118	1	0.000	3.093
Secondary and higher secondary level	1.494	0.036	1759	1	0.000	4.457
Graduate and above	2.212	0.071	982.284	1	0.000	9.139

(Contd...)

Table 2 *(Contd...)*

	B	S.E.	Wald	df	Sig.	Exp(B) (Odds Ratio)
Others	0.888	0.057	244.648	1	0.000	2.43
Highest level of education among the male member of households (® Illiterate)			817.909	5	0.000	
Primary level	0.614	0.044	195.869	1	0.000	1.849
Upper primary level	0.721	0.044	273.496	1	0.000	2.057
Secondary and higher secondary level	1.026	0.044	549.655	1	0.000	2.791
Graduate and above	1.5	0.058	663.72	1	0.000	4.481
Others	0.578	0.059	96.523	1	0.000	1.783
Family size(® less than and equal to three)			411.927	3	0.000	
More than three but less than and equal to five	-0.304	0.028	116.123	1	0.000	0.738
More than five but less than and equal to seven	-0.565	0.033	289.321	1	0.000	0.568
More than seven	-0.712	0.041	298.608	1	0.000	0.491
Occupation (® Self-employed in agriculture)			1582	5	0.000	
Self-employed in non-agriculture	0.522	0.031	286.556	1	0.000	1.686
Regular wage and salary earning	0.763	0.036	458.259	1	0.000	2.146
Casual labour in agriculture	-0.649	0.033	377.652	1	0.000	0.523
Casual labour in non-agriculture*	0.033	0.033	0.981	1	0.322	1.034
Other labour	0.498	0.05	98.445	1	0.000	1.646
Constant	-1.421	0.048	859.927	1	0.000	0.242

The results of the binary logistic regression coefficients show that the social group, religion, highest level of education among female and male member of households, family size and occupation of the household are significant contributing factors as far as use of latrine is concerned in rural India. On examining the coefficient estimates, we see that all the coefficients of religion, highest level of education among female and male member

of households and occupation of the household (except Casual Labour in Agriculture) have a positive effect, whereas all the coefficients of social group and family size have negative effects. A positive estimate of logistic regression coefficients indicate an increase in odds of use of latrine, while a negative estimate indicated a decrease in odds of use of latrine with respect to the reference category for a given independent variable when all other independent factors are controlled. It may also be observed from column 5 that all the coefficients (except casual labour in non-agriculture in case of independent variable occupation) are found to be statistically significant (<0.05) at 95 per cent level of significance. Here it may be of interest to note that the gender of head of households is not a significant contributing factor for use of latrine implying that households headed by both males and females are equally using latrine.

The study reveals that the odds of use of latrine of households are lesser for the social groups 'Other Backward Castes (OBCs)', 'Scheduled Castes (SCs)' and 'Scheduled Tribes (STs)'as compared to 'Others'. While the odds of use of latrine of ST households are 46 per cent less, the same for an SC and OBC households are less by 63 and 54 per cent, respectively.This finding is important as it reveals that the households of castes at the lower end of the social ladder are less likely to use latrine. It is also important to note that among the social groups, SC households are less likely to use latrine, followed by OBC and ST in rural India. Taking 'Hindu' as the reference category for religion, one can see that odds of use of latrine of households of other categories of religion are very high. Odds of use of latrine of households are increased by 157 per cent for Muslim households, the same for Sikh and Buddhist households are 700 and 398 per cent, respectively. For persons belonging to Christian households the odds of use of latrine are significantly higher by about 11 times.

The link between education, especially female education and use of latrine in rural India is important.The odds ratios for different categories of independent variable related to highest level of education amongst female and male members of households by taking 'Illiterate' as a reference category are given separately in Table 2. The finding reveals that the education of both female and male members of family has a positive impact on use of latrine. It is found that as the education level of family member increases, the use of latrine also increases, but the magnitude of increase is more for increase in education level of female member as compared to male member of the family.The odds of use of latrine of households, where highest level of education among female member of households is primary are increased by 120 per cent as compared to the households, where females are 'Illiterate'. The same are increased by 201, 346 and 814 per cent for the households, where highest levels of education among female members are upper primary, secondary and higher secondary and graduate & above level, respectively. Similarly, it is observed that the odds of use of latrine of

households, where highest level of education among male member of households is primary are increased by 85 per cent as compared to the households, where males are 'Illiterate'. The same are increased by 101, 180 and 348 per cent for the households, where highest level of education amongst male member of households are upper primary, secondary & higher secondary and graduate and above level, respectively.

The size of family in rural India is also an important factor and having an impact on use of latrine of households. The study reveals that as the family size increases, the odds of use of latrine of family decreases. As compared to family size 'less than and equal to three', the odds of use of latrine of families with size 'more than three but less than and equal to five' are reduced by almost 26 per cent, the odds for the families with size 'more than five but less than and equal to seven' and families with size 'more than seven' are reduced by 43 and 51 per cent. The study reveals that in the rural India occupation of head of households is also an important factor and needs specific attention. The highest use of latrine (increased by 115 per cent) is observed for those households where head of households is regular wage and salary earning as compared to households where head of households is 'self-employed in Agriculture'. Also one observes that the lowest use of latrine (reduced by 48 per cent) is found for those households where head of household is casual labour in agriculture. For the households whose occupational status is 'Self-employed in Non-Agriculture', the odds of use of latrines are 69 per cent more as compared to households whose occupational status is 'Self-employed in Agriculture'. It can be seen that the situation of households with occupation status as labourer both agriculture and non-agriculture is of utmost concern for the use of latrine in rural India.

Conclusions and Policy Recommendations

The influence of various socio-economic factors on use of latrine by the rural households has been discussed in the above sections. The study reveals that the selected socio-economic factors (except gender of head of households) do have a significant impact on the probability of use of latrine of the households. Open defecation by the members of the households of castes at the lower end of the social ladder, including OBCs is more as compared to other castes. It is also found that the odds of use of latrine by the members of households belonging to religions other than Hindu are very high as compared to 'Hindu'. Hence, there is a need to focus on deprived groups of society in terms of awareness creation, so as to ensure the universal sanitation coverage. A separate policy initiative aimed at maximising the use of latrine amongst members of households belonging to different social and religious groups should be the priority of the government.

The probability of use of latrine of rural households increases as level of educational attainment increases; this indicates a positive link between use of latrine and levels of education amongst female and male members of households. The impact of education on use of latrine has been observed, even with the

minimum shift in education from illiterate to primary level and further it goes on increasing as the education level increases. It has further been observed that the impact of education of female members on use of latrine is higher than the male members. So for making rural India free from open defecation, education especially female education is an important contributory factor. Thus, there is a need for the policy makers to study how increasing levels of education have an impact on the use of latrine of the households and to design special interventions / programmes to improve the education level of members of households, especially female members.

The odds of use of latrine by households of higher family size are less as compared to the households with lower size of family, indicates that higher the family density, lower the rate of use of latrine and higher the rate of open defecation which may be due to the fact that the accessibility of latrines may not be adequate. Thus, confronting the challenge of reducing open defecation will depend on the ability of policy makers to address the need for having an adequate family size through family planning interventions. The study reveals that in rural India, occupation of head of households is also an important factor and needs specific attention. It is found that the probability of use of latrine is very high for those households, where the head of households is regular wage and salary earning. It implies that the regular flow of income in the household results in higher rates of usage of latrine. Thus, policy makers should design policies that ensure interests of low-income people, vulnerable sections and provide easy access to basic necessities.

References

1. World Health Organisation and UNICEF (2014),"Progress on Sanitation and Drinking-Water – 2014 Update",WHO Press, WHO, Geneva, Switzerland.

2. World Bank (2010),"The Economic Impacts of Inadequate Sanitation in India", Water and Sanitation Programme (WSP), World Bank (https://www.wsp.org/sites/wsp.org/files/publications/wsp-esi-india.pdf).

3. Census (2011), "Houses, Household Amenities and Assets: House-listing and Housing Census Data Highlights-2011", Office of the Registrar General of India (ORGI), Data Processing Division (DPD), New Delhi (http://censusindia.gov.in/2011census/hlo/HLO_Tables.html).

4. Dreze, I. and M. Murthi (2001),"Fertility, Education and Development: Evidence from India", *Population and Development Review,* Vol. 27, No. 1, pp. 33-63.

6. Spears, D. (2013),"How Much International Variation in Child Height can Open Defecation Explain", World Bank Policy Research Working Paper, No. 6351, Sustainable Development Network, Water and Sanitation Programme, World Bank.

7. Human Development Report (2014),"Sustaining Human Progress: Reducing Vulnerability and Building Resilience",United Nations Development Programme (UNDP), New York, USA.

8. Government of India (2014),"Guidelines for Swachh Bharat Mission-Gramin", Ministry of Drinking Water and Sanitation (Website: www.mdws.gov.in).

9. Government of India (2015),"Budget Speech of Minister of Finance for 2015-16", Ministry of Finance, Government of India.

10. Baby, V. K. and Reddy, V. R. (2013),"How Effective are the New WASH Security Guidelines for India?-An Empirical Case Study of Andhra Pradesh Water Policy", Vol. 15, Issue 4, pp. 535–553.

11. Government of India (2013),"Drinking Water, Sanitation, Hygiene and Housing Condition in India",National Sample Survey Office, Ministry of Statistics and Programme Implementation, Government of India.

12. Government of India (2013),"Key Indicators of Drinking Water, Sanitation, Hygiene and Housing Condition in India', National Sample Survey Office, Ministry of Statistics and Programme Implementation, Government of India.