Empirical Study of Swachh Bharat Scheme Across States of India With Special Reference to Sanitization

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ABSTRACT

As per the swachhta report by NSSO in 2015, approximately 52 percent of the rural poor in India still defecates in open. This problem is major one and needed to be addressed at the national level. Government of India launched Swachh Bharat Mission- Gramin in 2014, and the allocation of funds tripled from 2,850 crore to 9000 crore. Taking cognizance of open defecation issue in the rural areas, 97 percent of the funds was been allocated to IHHL (Individual House Hold Laterines). The study takes into consideration various factors affecting the availability of toilets in rural India across different states. Panel data model is been used for the cross sectional and time series study of factors considering sanitation facilities. The results indicated that Kerala, Maharashtra and Sikkim were few states declared to be defecation free earlier signifying better implementation of government policies.

Introduction

India, best defined as the abode of heterogeneous in homogeneity. Everything here has a significance and a custom it followed, follows and continues to fall upon. The purdah came when humans started wearing clothes with the sense of representing a designation and signifying what they are in a society. It holds one's dignity, power and valor in place and state its facets respectively.

But still there is, this question, that is on the 'dignity of people'. Where does the respect and repository dignity go away while open-defecation? Why is that civil sense of being has been and continues to be so bifocal in its approach? Why is it a customary trend being followed since ages to carry on morning rituals in the greens, uncovered-unsafe? Why at the time of defecating in open it becomes a superfluous practice? Why it becomes superfluous based on gender or age either? Definitely a very forged phenomenon for men and children to be allowed so and keeping women at bay (Naidu, 2016).

Defying the phenomenon, from the low toned whispers and inhibitions to the important public speeches, confidential yet credible welfare forum discussions and becoming the most loudly voiced concern, lavatories have come a long way. A great irony indeed! The-should be camouflaged is not camouflaged, but camouflaged are the minds and practices...
A country of 1.324 billion population in 2016, GDP OF 2.264 trillion USD, 248.8 million households (Annual Report, 2016) and the irony that more than 50 percent of the rural population still defecates in open. The statistics is really alarming as we can see in table 1 that India has one of the highest percentages of open defecation. In US, UK and Singapore the percentage of people involved in defecating openly is zero, whereas even in Bangladesh and Pakistan it is only 5 and 12 percent respectively which is quite less as compared to India(UNDP, 2016). Over the period of time it has been observed that the situation has improved a lot, but the question is does it suffice? Therefore, seeing the severity

of the situation government came up with different policies to expedite the construction of toilets in rural areas.

There was a substantial hike in the money allotted for the construction of toilets and social expenditure increased substantially. But the question is that whether access to toilets change the attitude and preferences of the rural people which remains unanswered due to lack of official data. (Annual Report, 2016).

It has been confirmed through statistics that rural people have more access to latrines in 2014 as compared in 1990s. In 1993, 85.8 percent didn't have latrine facility whereas the situation improved much in 2012 in which it decreased to 59.4 percent. According to the findings of NSSO's report 2012, it was found just 1.7 percent and 0.2 percent of the households in rural and urban areas respectively, though have access to latrines yet they prefer not to use it due to various reasons areas. Now, the important question for policy makers is whether they should focus on building more toilets or to change the behavior of people to use more toilets. The statistics has suggested that building more toilets means more access. 95.6 percent rural people having access to toilets are using it according to the NSSO's Swachhta Status Report 2014.

This study focuses on the impact of different macroeconomic factors affecting the sanitation facilities and usage of toilets in India. Different states of India is under coverage in this study and uses panel data model or least square dummy variable model to estimate the impact of factors and role of policies in it

1.1   Government Policies for Sanitation

Various sanitation programs and campaigns has been launched and implemented carrying different objectives and motives. Central Rural Sanitation Programme (CRSP) which was launched in 1986 aims at improving quality of life to women. Expansion of CRSP led to a new program named total sanitation campaign (TSC) in 1999 which included

hygiene, sanitation and waste disposal. TSC further in 2013 was been renamed as Nirmal Bharat Abhiyan which envisages the comprehensive coverage of rural India encompassing all the activities mentioned in TSC. Later in 2014 Swachh Bharat Mission was launched with the primary motive to eradicate open defecation completely from India. Its objectives include eradication of manual scavenging, modern municipal solid waste management, bring awareness about sanitation and its implication on human health (NSSO, 2016). To fulfill the objectives, the resources and funds were increased three times from Rs 2,850 crore to Rs 9000 crore. Allocation of 97 percent of the total funds to IHHL ((Individual House Hold Laterines) itself tells the magnitude and significance allotted to the mission.

Prime Minister Mr. Modi has taken up this issue very seriously which is been depicted during his speech in his first Independence Day address. He emphasized on building more toilets, cleanliness drive, hygiene and increasing sanitation facilities. To fulfil this objective government moved ahead and constructed around 80 lakh toilets across India. Swachh Bharat Mission is supported by World Bank who approved loan worth US $ 1.5 billion for it. To make India defecation free in open, this mission aims constructing 12 crore toilets in rural India by October 2019 at a projected cost of Rs 1.96 lakh crore.

People still are apprehensive about using toilets especially in state like Uttar Pradesh and prefer to go out in fields. As there isn't proper waste management and drainage system in rural area, they don't use those constructed toilets and are irritated with the idea. Actually, sanitation is a behavioral issue and it needs to be changed on the psychological part as people are not very clear and transparent about the change and behavior and attitude towards sanitation theme. As is very beautifully depicted in the recent film, "Toilet Ek Prem Katha" in which, a newlywed lady had to go head over heels to build a toilet in the premises. The orthodox mindset of the family and elders that a lady should not go to the kitchen if the toilet is within the premises of the house, community habits and rigidity to change are the major challenges still in rural areas. Moreover, SBM guidelines only provide an incentive amount to build a toilet and don't offer full cost of the toilet. Since sanitation is more a behavioral issue and government can only facilitate by providing incentives and promoting to build toilets, but the change has to be bought at the mindset level. Officials believe to eradicate open defecation; a supply driven approach won't suffice rather it should be a more kind of transformation at the mindset level.

In India the highest percentage of households having toilet facilities in 2001 was Mizoram with 89.1 percent, followed by Kerala, Manipur and Tripura with 84, 82 and 81.5 percent. The lowest percentage lies in Bihar, Orissa and Chhattisgarh with 19.2, 14.9 and 14.2 percent respectively. In 2014, Nagaland topped the list and 100 percent of the households have toilet facilities followed by Sikkim, Mizoram, Manipur and Tripura with more than 97 percent in each of the states. The lowest again been Jharkand, Orissa and Madhya Pradesh with 9.5, 18.7 and 21.0 percent respectively.

Research Design and Methods

This study is a secondary study based on the data collected from the latest report of ministry of drinking water and sanitation, government of India (2016). It takes into consideration 28 states and the factors affecting the availability of toilets are studied state wise. Panel data or least square dummy variable model is employed to study the impact of variables across different states and time wise. The time period is taken into consideration is 2001, 2011, and 2014. As these years have great impact in terms of policy implementation.

2.1 Model Used: Panel Data or Least Square Dummy Variable

Panel data is employed where both cross section and time series data are pooled together across time and space for more than two or more time periods. The paper analyses the toilet availability which is a predictor variable (Y) with respect to the state gross domestic product (X1), Social Expenditure (X2) and Literacy rate (X3). Therefore, data has been obtained on twenty- eight states across India. Data for each state on the preceding four variables are available for the period 2001, 2011, and 2014. Thus, there are twenty-eight cross-sectional units and three time periods. In all, therefore, we have 84 observations. A priori, Y is expected to be positively related to X2 and X3.

Pooling, or combining, all the 84 observations, we can write the toilet availability function as:

$$Y_{it} = \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + u_{it} \quad (1.0)$$
$$i = 1, 2, 3, 4 \ldots 28 \text{ and } t = 1, 2, 3$$

where i stands for the ith cross-sectional unit and t for the tth time period

Panel data model also known as least square dummy variable model takes both cross section and time series data for estimation of the coefficients. Amongst different possibilities of coefficients of intercept and slope varying across time and space the best outcome was achieved when the intercept varied across individuals, but slope coefficients were constant.

Upon taking into consideration various models the most appropriate one is individuality of each state is considered. In this the intercept is been varied across each state however, the slope coefficients remain constant. To see this, The model can be written as ,

$$Y_{it} = \beta_{1i} + \beta 2 X_{2i} + \beta 3 X_{3it} + u_{it} \quad (1.1)$$

The subscript i on the intercept term suggests that the intercepts of the different states may be different; these differences may be due to special characteristics of each state, such as the policies adopted by the state government, its implementation time and cultural differences between the states.

In this model it is seen that fixed effect is applicable in a way that, although the intercept may fluctuate across individual states (here the twenty eight states), but each individual's intercept does not vary over time; that is it is time invariant. We have used the dummy variable technique particularly, the differential intercepts dummies. Therefore, we write (1.1) as:

$Y_{it} = \alpha_1 + \alpha_2 D_{2i} + \alpha_3\ D_{3i} + \alpha_4 D_{4i} + \ldots\ldots\ \alpha_{27}D_{27i} + \ \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + u_{it}$ (1.2)

where $D_{2i} = 1$ if the observation belongs to AP, 0 otherwise; $D_{3i} = 1$ if the observation belongs to Arunanchal Pradesh, 0 otherwise; and so on. Since we have twenty-eight states, we have used twenty seven dummies to avoid falling into the dummy-variable trap (i.e., the situation of perfect collinearity). For Andhra Pradesh state we havn't used any dummies as it is used to establish the fixed effect otherwise the model would fall into the trap and give spurious results.

The results based on equation (1.2) are as follows and depicted in Table 2,3and 4.

Y_{it} = -67.984 + 40.83 D_{2i} + 35.62 D_{3i} -7.26 D_{4i} -28.84 D_{5i} +16.38 D_{6i}-10.098 D_{7i}+ 8.945 D_{8i}+ 7.438 D_{9i}+ 27.805 D_{10i} -21.977 D_{11i} -12.391 D_{12i}+ 34.911 D_{13i}-19.980 D_{14i} -15.077 D_{15i}+ 55.024D_{16i}+22.029 D_{17i}+ 33.235D_{18i}+ 45.224 D_{19i} -23.967 D_{20i}+29.411D_{21i}-15.355 D_{22i} - 19.636 D_{23i}+ 35.519 D_{24i}-5.829 D_{25i}-1.432 D_{26i}+ 4.766 D_{27i}+ 0.0000356 X_{2i}t + 0.788 X_{3it}+ 1.008 X_{4it} (1.3)

R^2 = 0.943, DW = 2.42

On comparing the results of equation 1.3 with the rest of the equations in fixed effects or least squares dummy variable model, it gives the most appropriate result. In it many of the estimated coefficients are individually highly significant, which is the expected outcome. These differences in the intercepts may be due to unique features of each state, such as differences in implementation of policies by the state government, cultural blindfold of traditional rural practices, factors such as political rights, availability of land and resources etc.

The negative intercept of most of the states indicates that the progress on sanitation is not as desired and is been caught by inadequate investments in different campaigns, behavioral issues as despite toilets been constructed they do not intend to use it and social norms which accept or even encourage open defecation.

Therefore, judged by the statistical significance of the estimated coefficients, and the fact that the R^2 value has increased substantially with respect to other models when they were run and the fact that the Durbin-Watson d value is much higher, suggesting that model (1.2) is a better model as compared to others.

Conclusion

Due to initiatives by the government Kerala was the first high density population state to be declared as Open Defecation Free (ODF) in 2016, although in low population density Sikkim and Himachal Pradesh have achieved the status of ODF.

The most important thing is the change in mindset to adopt sanitation practices and break thousand-year-old norms. The findings indicate that literacy rate is considered to be the most important factor and significant one for increasing the toilets and using it. Although social expenditure is also an important factor but its impact is less as compared to the literacy rate. Therefore, we can conclude that to change the behavior and perception of the rural people, education plays a major role. To help ensure the use of toilets by the rural people, the international bank has provided US $ 25 million loan to help in community led programs which may lead to

the change in their behavior with respect to the usage of toilets in rural India. The negative intercept of most of the states indicates that the progress on sanitation has been hindered by inadequate investments in behaviour change campaigns, lack of affordable products for the poor, and social norms which accept or even encourage open defecation. Kerala, Maharastra, Sikkim and Himanchal Pradesh have a positive and significant intercept indicating that the state governments has implemented the policies efficiently and they also have a higher literacy rate as compared to rest of the states.

Tables:

Table 1: People Practicing Open Defecation in Countries

Country	United States	United Kingdom	Singapore	China	India	Bangladesh	Pakistan
Population (million)	323.1	65.65	5.601	1379	1324	163	193.2
Open Defecation (% of population)	0	0	0	2	40	5	12

Source: World Bank Indicators, 2016

Table 2 :Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.971ᵃ	.943	.911	8.47747	2.480

Table 3

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	63024.982	30	2100.833	29.232	.000ᵇ
Residual	3808.976	53	71.867		
Total	66833.958	83			

Table 4: Coefficients

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1 (Constant)	-67.984	14.042		-4.842	.000
NSDP	1.358E-6	.000	.007	.065	.949
SE	.788	.295	.200	2.675	.010
LR	1.008	.274	.352	3.682	.001
D1	40.833	7.741	.269	5.275	.000
D2	35.621	7.537	.234	4.726	.000

D3	-7.262	7.635	-.048	-.951	.346
D4	-28.849	8.118	-.190	-3.554	.001
D5	16.386	11.179	.108	1.466	.149
D6	-10.098	7.566	-.066	-1.335	.188
D7	8.945	7.367	.059	1.214	.230
D8	7.438	9.634	.049	.772	.444
D9	27.805	7.724	.183	3.600	.001
D10	-21.977	7.754	-.145	-2.834	.006
D11	-12.391	7.243	-.082	-1.711	.093
D12	34.911	10.756	.230	3.246	.002
D13	-19.580	6.983	-.129	-2.804	.007
D14	-15.077	11.062	-.099	-1.363	.179
D15	55.024	9.677	.362	5.686	.000
D16	22.029	8.245	.145	2.672	.010
D17	33.235	11.224	.219	2.961	.005
D18	45.224	9.529	.298	4.746	.000
D19	-23.967	7.349	-.158	-3.261	.002
D20	29.411	8.703	.193	3.379	.001
D21	-15.355	7.136	-.101	-2.152	.036
D22	45.841	9.900	.302	4.630	.000
D23	-19.636	8.109	-.129	-2.422	.019
D24	35.519	9.543	.234	3.722	.000
D25	-5.829	7.767	-.038	-.750	.456
D26	-1.432	8.392	-.009	-.171	.865
D27	4.766	7.270	.031	.656	.515

Author's Calculation

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