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# A STUDY ON DETERMINANTS OF ADOPTION OF OPEN DEFECATION FREE INNOVATIONS IN THALLI BLOCK OF KRISHNAGIRI DISTRICT

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**Abstract**

Open defecation is largely practiced for generations and it is highly accepted traditional practice and deeply rooted in minds of population in India. Free from open defecation is not a substance of access to toilets, but it is subjected to motivational factors and mind set of people. Economic condition, values, awareness and environment are determinants of adoption of open defecation free innovations among respondents. Significant difference is prevailing in determinants of adoption of open defecation free innovations among demographics of respondents. Economic condition, awareness, environment and values are positively and significantly impacting rate of success of open defecation free innovations among respondents. Therefore, adequate credit support and incentives should be given to respondents for construction of toilets and religious, social and communal groups must educate respondents to remove their cultural fear in the use of toilets.

Key Words: Adoption, Determinants, Open Defecation Free Innovations, Rate of Success

## 1. INTRODUCTION

Open defecation is largely practiced for generations and it is highly accepted traditional practice and deeply rooted in minds of population in India (Anuradha et al 2017). Open defecation is an extensive practice in India and around 65,000 tons of faeces in to environment daily (Panda et al 2017). As per census of 2011, 46.90 per cent of people are having toilets and 3.20 per cent of households are using public toilets and rest of 49.80 per cent of population is continuously defecating in open spaces.

In rural areas, open defecation is everywhere across all segments of people though the bottom two quintiles of wealth practice it on the entire rural communities (Banerjee et al 2013). Open defecation in India is one of the main health hazards and it damages environment and most of rural people do not know the health problems associated with open defecation (Geeta, 2014). Open defecation is highly related with environmental pollution, leading to risk of infections and diseases, poor educational and personal development and low level of productivity of adult people (Mbuya and Humphrey, 2016).

Constructing and using toilets is the most significant health intervention to understand appropriate use and maintenance of toilets and better personal and family hygiene (Debesay et al 2013). Free from open defecation is not a substance of access to toilets, but it is subjected to motivational factors and mind set of people (Jenkins and Curtis, 2005). Further, promotion of construction and use of toilets among people are mainly depending on resources availability, affordability, subsidies and incentives (Kar and Milward, 2011). Open defecation free environment is essential for improving social, economic and health standards of people and at the same time, it is determined by numerous factors. Therefore, it is necessary to study determinants of adoption of open defecation free innovations in Thalli block of Krishnagiri district.

## 2. REVIEW OF LITERAURE

Jewitt (2011) found that financial support, support from local communities, communication, awareness, access to toilets and subsidies were affecting open defecation free situation in rural areas. Mukherjee et al (2012) concluded that access to water and open area, vegetation, communication, subsidies, education and behavioural changes were significantly influencing sustainable development of open defecation free communities.

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Galan et al (2013) revealed that availability of sanitation facilities, access to toilets, economic condition and cultural values were preventing open defecation practices among rural people. Sara and Graham (2014) indicated that personal beliefs, awareness, socio-economic conditions and availability of toilets were facilitating open defecation free atmosphere in rural areas.

Desai et al (2015) showed that health, environment, privacy, safety and dignity of women were influencing open defecation free environment. Hathi et al (2016) found that caste, ethnic problems, cultural values and life style were affecting practice of open defecation free conditions of people in rural areas.

Odagiri et al (2017) concluded that social norms, lack of water, socio-economic conditions and level of wealth of communities were affecting open defecation free situations in rural areas. Alhassan and Anyarayor (2018) revealed that communication, health problems, security, income level, comforts, privacy and cultural beliefs were significantly influencing construction and sustainable use of toilets among respondents.

## 3. METHODOLOGY

The present study is carried out in Thalli block of Krishnagiri district. Respondents are selected by using simple random sampling method and data are collected from 300 respondents through questionnaire method. Percentages are calculated to know demographics of respondents. An exploratory factor analysis is done to find out determinants of adoption of open defecation free innovations among respondents. t-test and ANOVA test are used to scrutinize difference between demographics of respondents and determinants of adoption of open defecation free innovations. Multiple regression analysis is carried out to assess impact of determinants of adoption of open defecation free innovations on rate of success of open defecation free innovations.

## 4. RESULTS AND DISCUSSION

### 4.1. DEMOGRAPHICS OF RESPONDENTS

The demographics of respondents are given in Table-1. The results disclose that 64.67 per cent of respondents are females, while, 35.33 per cent of them are males and 31.67 per cent of them fall under age category of 31 – 40 years, while, 16.33 per cent of them fall under age category of below 20 years.

The results explain that 34.00 per cent of respondents are illiterates, while, 15.00 per cent of them have higher secondary education and 29.00 per cent of them earn monthly income of Rs.10,001 – Rs.15,000, while, 20.00 per cent of them earn monthly income of more than Rs.20,000.

**Table-1. Demographics of Respondents**

| Profile | Number of Respondents | Percentage |
|---|---|---|
| **Gender** | | |
| Male | 106 | 35.33 |
| Female | 194 | 64.67 |
| **Age Category** | | |
| Below 20 years | 49 | 16.33 |
| 21 – 30 years | 84 | 28.00 |
| 31 – 40 years | 95 | 31.67 |
| Above 40 years | 72 | 24.00 |
| **Education** | | |
| Illiterate | 102 | 34.00 |
| Primary | 83 | 27.67 |
| Secondary | 70 | 23.33 |
| Higher Secondary | 45 | 15.00 |
| **Monthly Income** | | |
| Less than Rs.10,000 | 71 | 23.67 |
| Rs.10,001 – Rs.15,000 | 87 | 29.00 |
| Rs.15,001 – Rs.20,000 | 82 | 27.33 |
| More than Rs.20,000 | 60 | 20.00 |
| **Marital Status** | | |
| Married | 244 | 81.33 |
| Unmarried | 56 | 18.67 |
| **Type of Family** | | |
| Joint | 179 | 59.67 |
| Nuclear | 121 | 40.33 |

The results illustrate that 81.33 per cent of respondents are married, while, 18.67 per cent of them are unmarried and 59.67 per cent of them have joint family, while, 40.33 per cent of them have nuclear family.

### 4.2. DETERMINANTS OF ADOPTION OF OPEN DEFECATION FREE INNOVATIONS

To find out determinants of adoption of open defecation free innovations among respondents, an exploratory factor analysis is done and the results are given in Table-2.

**Table-2. Determinants of Adoption of Open Defecation Free Innovations among Respondents**

| Determinant | Variables | Rotated Factor Loadings | Eigen Value | % of Variation | Determinant Name |
|---|---|---|---|---|---|
| **I** | Type of occupation | 0.66 | 2.48 | 22.98 | **Economic Condition** |
| | Level of income | 0.69 | | | |
| | Cost of construction | 0.67 | | | |
| | Incentives | 0.65 | | | |
| | Cost of maintenance | 0.63 | | | |
| | Inadequate credit | 0.68 | | | |
| **II** | Prestige | 0.69 | 2.29 | 19.35 | **Values** |
| | Resistance | 0.65 | | | |
| | Cultural practices | 0.63 | | | |
| | Social norms | 0.66 | | | |
| | Religious beliefs | 0.64 | | | |
| **III** | Knowledge | 0.65 | 1.13 | 16.52 | **Awareness** |
| | Communication | 0.68 | | | |
| | Campaigns | 0.64 | | | |
| | Messages | 0.67 | | | |
| **IV** | Sanitation facility | 0.68 | 1.01 | 13.70 | **Environment** |
| | Health condition | 0.63 | | | |
| | Proximity to open space | 0.65 | | | |
| | Cumulative Variation(%) | - | - | 72.52 | - |
| | Value of Cronbach's Alpha | - | - | - | 0.87 |

Principal Component Analysis.
Varimax Rotation.
Converged in $10^{th}$ iterations.

Value of Kaiser-Meyer-Olkin (KMO) test for assessment of adequacy of sampling is 0.874 and Chi-Square value of Bartlett's test for Sphericity is 0.0036 and it is significant at one per cent level. These measures display the method of factor analysis is suitable. Four determinants obtained has 72.55 per cent variation on variables under consideration and each of them shares variation of 22.98 per cent, 19.35 per cent, 16.52 per cent and 13.70 per cent as per the order of extraction.

**Determinant-I:** comprises of type of occupation, level of income, cost of construction, incentives, cost of maintenance and inadequate credit. Therefore, it is called as **Economic Condition.**

**Determinant-II:** includes prestige, resistance, cultural practices, social norms and religious beliefs. Hence, it is described as **Values.**

**Determinant-III:** consists of knowledge, communication, campaigns and messages. So, it is labeled as **Awareness.**

**Determinant -IV:** encompasses sanitation facility, health condition and proximity to open space. Thus, it is denoted as **Environment.**

Cronbach's Alpha value of the scale is 0.87, it elucidates that each measure is at acceptable level of internal consistency. Economic condition, values, awareness and environment are determinants of adoption of open defecation free innovations among respondents.

### 4.3. DEMOGRAPHICS OF RESPONDENTS AND DETERMINANTS OF ADOPTION OF OPEN DEFECATION FREE INNOVATIONS

To scrutinize difference between demographics of respondents and determinants of adoption of open defecation free innovations, t-test and ANOVA (Analysis of Variance) test are used and the results are given in Table-3.

**Table-3. Difference between Demographics of Respondents and Determinants of Adoption of Open Defecation Free Innovations**

| Particulars | t-Value / F-Value | Sig |
|---|---|---|
| Gender and Determinants of Adoption of Open Defecation Free Innovations | 4.635** (t-value) | .000 |
| Age Category and Determinants of Adoption of Open Defecation Free Innovations | 5.740** (F-value) | .000 |
| Education and Determinants of Adoption of Open Defecation Free Innovations | 5.584** (F-value) | .000 |
| Monthly Income and Determinants of Adoption of Open Defecation Free Innovations | 5.806** (F-value) | .000 |
| Marital Status and Determinants of Adoption of Open Defecation Free Innovations | 4.378** (t-value) | .000 |
| Type of Family and Determinants of Adoption of Open Defecation Free Innovations | 4.492** (t-value) | .000 |

** *Significant at 1 % level*

The t-values and F-values are demonstrating significant difference exits in determinants of adoption of open defecation free innovations among demographics of respondents at one cent level.

### 4.4. IMPACT OF DETERMINANTS OF ADOPTION OF OPEN DEFECATION FREE INNOVATIONS ON RATE OF SUCCESS OF OPEN DEFECATION FREE INNOVATIONS

To assess impact of determinants of adoption of open defecation free innovations on rate of success of open defecation free innovations, multiple regression analysis is carried out and the results are given in Table-4. $R^2$ and adjusted $R^2$ are 0.59 and 0.57 respectively revealing the regression model has good fit and it is implying that 57.00 per cent of variation in dependent variable is contributed by independent variables. F-value of 21.790 is disclosing the model is significant at one per cent level of significance.

**Table-4. Impact of Determinants of Adoption of Open Defecation Free Innovations on Rate of Success of Open Defecation Free Innovations**

| Determinants of Adoption of Open Defecation Free Innovations | Regression Coefficients | t-value | Sig |
|---|---|---|---|
| Intercept | 1.017** | 10.024 | .000 |
| Economic condition ($X_1$) | .448** | 6.736 | .000 |
| Values ($X_2$) | .325** | 5.562 | .000 |
| Awareness ($X_3$) | .390** | 6.145 | .000 |
| Environment ($X_4$) | .362** | 5.820 | .000 |
| $R^2$ | 0.59 | - | - |
| Adjusted $R^2$ | 0.57 | - | - |
| F | 21.790 | - | .000 |

** *Significant at 1 % level*

The results elucidate that economic condition, awareness, environment and values have positive and significant impact on rate of success of open defecation free innovations among respondents at one per cent level.

## 5. CONCLUSION

The above findings explicate that economic condition, values, awareness and environment are determinants of adoption of open defecation free innovations among respondents. Significant difference is prevailing in determinants of adoption of open defecation free innovations among demographics of respondents. Economic condition, awareness, environment and values are positively and significantly impacting rate of success of open defecation free innovations among respondents. Therefore, adequate credit support and incentives should be given to respondents for construction of toilets and religious, social and communal groups must educate respondents to remove their cultural fear in the use of toilets. Campaigns, advertisements and actions of community and social networks should motivate respondents to construct and use toilets regularly in order to avoid outbreak of diseases and other health related problems.

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