

## IMPACT OF PRADHAN MANTRI UJJWALA YOJANA ON IMPROVING THE SOCIO-ECONOMIC STATUS OF WOMEN

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### ABSTRACT

*The core component of human growth solely depends on clean, structured, and efficient energy sources that ultimately affect economic growth. The present study delves into the impact of Pradhan Mantri Ujjwala Yojana (PMUY) in Bihar. It assessed how well the scheme had helped in rural areas to improve the living standard of rural women. A total of 100 women households from 4 villages of 2 blocks under Samastipur district were included in the study. The socio-economic status shows that 49 per cent of respondents were aged between 31-45 years having annual family incomes of 50000 to 100000. 55% of the respondents have 4 or fewer members in the family, 93 % of respondents possess one gas cylinder, with 97% have a gas stove with two burners. Most of the respondents performed the role of homemaker and farmer as their primary and secondary occupations. Considering the impact, the scheme had a medium impact on 61% of respondents followed by high on 29% and low on 10% of the respondents. Further, the factors affecting the impact level were analyzed through multiple linear regression to determine the variance on the dependent variable. R-square value 0.632 depicts that about 63% of the variance in impact is caused by the eleven factors combinedly. Among the factors, the age of the respondents, social participation, and family income are positively significant at 1 per cent level of significance ( $p < 0.01$ ), mass media exposure and education are positively significant, and the size of the family is negatively significant at 5 per cent level of significance ( $p < 0.05$ ). The research findings suggest that the sustainability of the yojana depends on the social and economic condition of the respondents even after it has good impact among the beneficiaries. So, government should take appropriate measures to improvise the purchasing power of the beneficiaries.*

**Keywords:** fuel, multiple linear regression, socio-economic status, women, impact

### INTRODUCTION

Cooking is one of the important chores performed by most of the women in India. As routine work, women spend maximum time in the kitchen, so it captures their day-to-day life and restricts them only preparing to serving the food (Yadav, 2020). 65% of the total population stays in rural areas, primarily dependent on agriculture and allied sectors. Most of the households were deprived of clean cooking fuel and relied on conventional fuels such as firewood, coal, dung-cakes, etc., as primary sources of cooking. About 800 million poor Indian households depend on traditional solid fuels like Farm trash, coal, and cakes made from cow dung to compensate for their cooking needs (World Energy Outlook, 2017). Conventional fuels have numerous health hazards along with the capacity to pollute the micro environment of the house. Emissions from burning these fuels result in severe indoor pollution and have a detrimental impact on the health of women and children, leading to various respiratory disorders. Household air pollution arising from

the inefficient combustion of biomass fuels is a significant health hazard, causing almost 1.8 million premature deaths annually (Stanaway *et al.*, 2017). Furthermore, women and children are burdened with the laborious task of gathering firewood due to the restricted availability of cooking gas for those with low incomes (mall and Rani, 2019). Keeping in view the women empowerment and health condition, the Prime minister of India launched Pradhan Mantri Ujjwala Yojana (PMUY) on 1<sup>st</sup> May 2016 in the Ballia district of Uttar Pradesh. The 'Ministry of Petroleum & Natural Gas' has implemented the transformative scheme with the objective of empowering and safeguarding the health of women below the poverty line (BPL) by offer them access to clean cooking fuel through Liquefied Petroleum Gas (LPG) connections (Dhamija, 2023). Also, the Large-scale transitions to cleaner cooking promise substantial health (Smith, 2014; Health Effects Institute, 2019), environmental (Masera *et al.*, 2015), climate (Bond *et al.*, 2004; Bailis *et al.*, 2015), and gender empowerment benefits (Pachauri and Rao, 2013; Listo *et al.*, 2018). The yojana is noteworthy for two specific reasons.

Firstly, it has drawn attention to the crucial developmental matter of facilitating the use of clean cooking energy. Furthermore, the programme enhances the standard of living for impoverished women whose health concerns are often overlooked in domestic considerations (Jain, 2016). Yet, 85 percent of the recipients in rural Bihar, Madhya Pradesh, and Rajasthan rely on solid fuels for cooking because of budgetary constraints and gender disparities (Jebaraj, 2019). Bihar, one of India’s most populous states, with a considerable share of its population living in rural areas, has been a focal point for the implementation and impact assessment of PMUY. The socio-economic condition of women in Bihar has been a subject of concern due to prevalent poverty, limited access to education, and entrenched gender disparities. Women in rural Bihar often bear the brunt of traditional roles, constrained economic opportunities, and lack of access to modern amenities. This study endeavors to comprehend the socio-economic condition of women in Bihar and assess the impact of PMUY in enhancing their livelihoods. Through qualitative and quantitative analysis, this research aims to provide insights into the lived experiences of women beneficiaries of PMUY in Bihar.

**OBJECTIVE**

To know the impact of Pradhan Mantri Ujjwala Yojana on improving the socio-economic status of women

**METHODOLOGY**

The current study was conducted purposively in the Samastipur district of Bihar. Out of 20 blocks present

in the district, two blocks (i.e., Pusa and Kalyanpur) were selected randomly. Afterward, two villages from each block i.e., four villages and 25 respondents from each village chosen randomly to make the final sample of 100 (Behera and Mallick, 2023). The respondents considered for the study were active beneficiaries of PMUY, aged between 17 to 70 years. Ex-post-facto research design was employed to conduct the research (Mallick *et al.*, 2023). Socio-demographic data of the respondents were collected through an interview schedule prepared systematically. The impact of the yojana was delineated through a well-prepared schedule in which respondents provided pertinent information. The interview questions were analyzed using descriptive statistics in MS Excel (Version, 2007), and the result was portrayed by using (mean ± Standard deviation) in low, medium, and High groups. Factors influencing impact of the yojana were calculated in SPSS V.26 by using a multiple linear regression model as follows

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \epsilon$$

Where,

Y= Dependent Variable

$\beta_0$ = Intercept

$\beta_i$ = Slope for  $x_i$

$x$ = Independent variable

$\epsilon$ = error term

**RESULTS AND DISCUSSION**

**Table 1: Socio-demographic profile of the respondents**

(n=100)

Sr. No.	Socio-demographic Status	Categories	Frequency (Percent)
1	<b>Age</b>	Young (17-30)	23 (23.00)
		Middle-aged (31-45)	49 (49.00)
		Old (above 45)	28 (28.00)
2	<b>Caste</b>	GEN	12 (12.00)
		OBC	42 (42.00)
		SC	46 (46.00)
3	<b>Education</b>	Illiterate (0)	53 (53.00)
		Functionally literate (1)	15 (15.00)
		Primary (2)	14 (14.00)
		Middle (3)	06 (6.00)
		Secondary (4)	04 (4.00)
		Higher secondary (5)	06 (6.00)
	Graduation and above (6)	02 (2.00)	

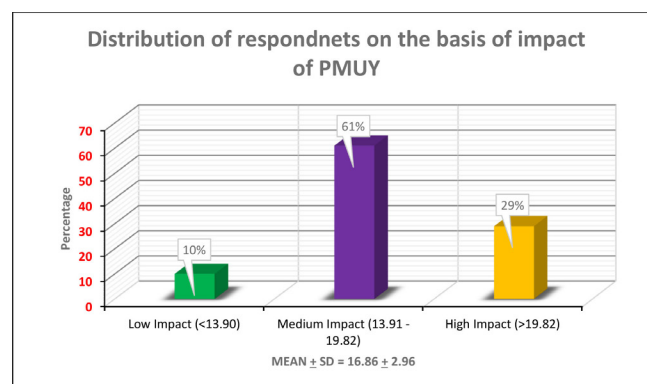
Sr. No.	Socio-demographic Status	Categories	Frequency (Percent)
4	Family type	Nuclear joint	71 (71.00) 29 (29.00)
5	Family size	Small ( $\leq 4$ members) Medium (5 – 8 members) Large ( $> 8$ members)	55 (55.00) 31 (31.00) 14 (14.00)
6	Housing type	Kutcha Pucca	80 (80.00) 20 (20.00)
7	Social participation	Low ( $< 1.05$ ) Medium (1.06-3.04) High ( $> 3.04$ )	13 (13.00) 78 (78.00) 09 (9.00)
8	Mass media exposure	Low ( $\leq 2.71$ ) Medium (2.72-6.28) High ( $> 6.28$ )	15 (15.00) 77 (77.00) 18 (18.00)
9	Annual income (₹)	50,000-1,00,000 1,00,001-2,00,000 2,00,001-3,00,000	86 (86.00) 13 (13.00) 01 (1.00)
10	Number of burners in gas stove	One Two More than two	03 (3.00) 97 (97.00) 0 (0.00)
11	Number of gas cylinder	One Two More than two	93 (93.00) 07 (7.00) 0 (0.00)

Table-1 revealed the data on the Socio-demographic profile of the women beneficiaries of Pradhan Mantri Ujjwala Yojana (PMUY). According to the table, the Majority (49%) of the respondents in the study area were belonging to middle-aged group (31- 45 years). Majority of beneficiaries belongs to Scheduled castes (46%) followed by the OBC & general caste. The majority i.e. 53% of respondents were illiterate, and 15% were functionally literate (can read and write only). 14% had completed primary school, 6% completed middle school and higher secondary education and 4% were educated up to secondary level. Only two members in the study area completed the graduation course. It was concluded that out of 100 respondents, 71% of the women beneficiaries belonged to the nuclear family. Most of the families were small size having members four or less, which accounts for 55 per cent, followed by 31 per cent having medium sized (5-8 members) families and 14 per cent having large families with more than eight members. 80 percent of respondents lived in Kutcha houses, while the remaining 34% of the respondents lived in pucca houses. The majority (78%) of the respondents had medium (1.06-3.04) levels of social participation, and 13 percent had low ( $\leq 1.05$ ), while 9 percent of the respondents had high ( $> 3.04$ ) levels of social participation. The result has been partially supported by Akbari *et al.* (2023). It could be observed that respondents had medium to high levels of mass media exposure. 77 percent of respondents were found in the medium category (2.72-6.28), followed by 18 percent had a high level ( $> 6.28$ ), and only 15 percent had a low level ( $\leq 2.71$ ) of mass media exposure.

A bird's eye view of the socio-economic data showed that 86% percent of respondents in the research region had a low level of yearly income (₹50,000- ₹1,00,000). While 13% percent had a medium annual income (₹1,00,001- 2,00,000), and 1 per cent found to have high annual income (₹2,00,001- ₹3,00,000). The result was in line with Chaudhary *et al.* (2022), who found that 68 per cent farmers were income having (₹50,000- ₹1,00,000). 97% of the respondents had two-burner gas stoves, and 3% of them were found to possess single-burner gas stoves under their possession. 93% of the beneficiaries had only one gas cylinder in their households, and 7% of them had two gas cylinders.

### Impact of Pradhan Mantri Ujjwala Yojana

The impact of PMUY was chosen as the dependent variable for the current study, and it was assessed using independent factors.



It is observed the results from Figure 1 that Pradhan Mantri Ujjwala Yojana had a medium impact on 61% of respondents (13.91 to 19.82), a strong impact on 29% of respondents (>19.82), and a poor impact on 10%

of respondents (13.90 or less). (Amose and Sreedevi, 2017) considered economic factors such as occupation, income, education and health in their study and assessed economic impact of the PMUY scheme.

**Factors influencing the dependent variable (Impact of PMUY) of respondents.**

**Table 2 : Model Summary of dependent variable i.e. Impact of PMUY**

(n=100)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.795 <sup>a</sup>	.632	.586	1.904	.632	13.716	11	88	.000

a. Predictors: (Constant), NGC, FTYPE, BGS, ER, Caste, HT, Age, FI, FSIZE, SP, MME  
 b. Dependent Variable: Impact

A close analysis of Table-2 revealed the robustness of the multiple linear regression model through multiple correlation value (R) 0.795 and high R<sup>2</sup> value i.e. 0.632, which shows 63% of the variation in impact of the yojana explained by the eleven variables considered in the study.

ANOVA table gives a clear picture of the Significant F value (13.716) at 1 per cent level of significance (LoS) (p=0.000). Table-3 shows that the overall fit of the model is satisfactory.

**Table 3: suitability of the model through ANOVA table**

(n=100)

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	546.999	11	49.727	13.716	.000
Residual	319.041	88	3.625		
Total	866.040	99			

**Relational analysis of impact and selected independent factors**

**Table 4 : Effect of independent variables on Impact through multiple linear regression**

(n=100)

Sr. No.	Model B	Unstandardized Coefficients		Standardized Coefficients	t-value	p-value Sig.
		Std. Error	Beta			
X <sub>1</sub>	(Constant)	13.333	2.647		5.038	.000
X <sub>2</sub>	Age	.061	.018	.242	3.420	.001***
X <sub>3</sub>	Caste	-.166	.305	-.038	-.545	.587
X <sub>4</sub>	Family Type	-.151	.496	-.023	-.305	.761
X <sub>5</sub>	Family Size	-.160	.068	-.182	-2.345	.021**
X <sub>6</sub>	Housing Type	.117	.510	.016	.230	.819
X <sub>7</sub>	Education	.343	.139	.192	2.478	.015**
X <sub>8</sub>	Social Participation	.701	.241	.234	2.914	.005***
X <sub>9</sub>	Mass Media Exposure	.354	.146	.199	2.426	.017**
X <sub>10</sub>	BGS	-1.004	1.176	-.058	-.854	.396
X <sub>11</sub>	Family Income	2.394	.000	.301	4.020	.000***
X <sub>12</sub>	NGC	-1.239	.772	-.107	-1.604	.112

\*\*\* and \*\*, depicts value is significant at 1% and 5% level respectively (2-tailed)

The multiple linear regression is fitted to the data as one response variable (impact) depends on various predictive variables. A glance at Table-4 divulged that out of eleven variables, five variables have no significant influence on impact, and rest six are significant. Variables such as Caste, Family type, Housing type, Burners in gas stoves (BGS)

and Number of gas cylinders (NGS) were not predicting the impact. A detailed explanation is provided for the variables that had a significant effect on the impact.

**(1) Age**

The age of the respondents was positively significant

at 1 percent ( $p=0.001, <0.01$ ), and 't' value was 3.420. The likelihood of impact was increased by a factor of 0.061 with one unit increase in age, keeping other variables constant. The result is in line with expectations, as the highest number of the respondents were between 17 to 45 years.

### (2) Family Size

It was found that the number of members in the family was negatively significant at 5% ( $p=0.021$ ), with a t value of -2.345. The likelihood of impact was decreased by a factor of 0.160 with one unit increase in family size, ceteris paribus. It could be concluded that with the increasing number of members in the family, purchasing power decreases with the heavy consumption of fuel.

### (3) Education

The predictor variable education was found to be positively significant at 5 per cent ( $p=0.15$ ) and t value 2.478. With  $\beta$ -value, the likelihood of impact was increased by a factor of 0.343 with a unit increase in education, ceteris paribus.

### (4) Social Participation

In the study, social participation was found to be positively significant in 1% LoS ( $p=0.005$ ), with a t value of 2.914. The likelihood of impact was increased by a factor of 0.701 with one unit increase in social participation, ceteris paribus. The social participation of the respondents was positively affected the adoption and continuation of the yojana. Result is in line with (Gould and Urpelainen, 2018; Mahammad et al., 2022) who found that Top of Form households where women are involved in decision-making were more likely to adopt LPG for cooking compared to households where a man is the sole decision-maker.

### (5) Mass Media Exposure

It was found to be the variable was significant at 5 per cent ( $p=0.17, <0.05$ ). The obtained t-value is 2.426, which shows the positive significance of the variable. The likelihood of impact was increased by a factor of 0.354 with one unit increase in the variable, ceteris paribus. In the study locale, the frequent mass media exposure by the respondents influenced the impact of the scheme.

### (6) Family Income

The income of the respondents was found to be highly significant with a p-value 0.000, 1% LoS. The obtained t value of 4.020 shows that the income is positively significant. The likelihood of impact was increased by a factor of 2.394 with one unit increase in family income, ceteris paribus. The purchasing power of the respondents depended on the annual

income of the family.

## CONCLUSION

After analyzing the finding it could be concluded that the study engrossed a thorough evaluation of the 'Pradhan Mantri Ujjwala Yojana' (PMUY) and its impact on the social and economic status of women in Bihar. Though gender inequalities prevailed, the impact of the scheme was medium to high in the study locale. Factors such as age, education, family size, social participation, mass media exposure and income were contributing towards impact of the scheme. Annual income of the family contributed highest towards impact because the purchasing power increases with increase in income. By examining various socio-economic factors, it aims to contribute to the ongoing discourse on gender-responsive policymaking and program implementation.

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## CONFLICT OF INTEREST

We, the authors, have no competing or conflict of interest.

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