India Social Scheme Impacts on Poverty Note

Introduction to Poverty and Social Schemes

India has reduced poverty greatly due to rapid economic growth, but there is still much to be done to ensure the standards of living increase in the country. India has reduced its number of multidimensional poor people by 273 million in the last 10 years (India Planning Commission, 2013) and halved the number of those under the poverty line from 1990 to 2011 (UNDP's Global Multidimensional Poverty Index Report, 2020). Though the urban and rural poverty rates have dropped to 13.7 and 25.7 respectively in 2011-12 (India Planning Commission, 2013), 54 percent of Indians continue to be vulnerable to poverty and a significant imbalance between states and ethnic/social groups (Ivins, 2013). With a comparatively lower Gini to other BRIC of 35.75, it's poverty headcount ratio (2011 PPP) of those living under $5.5 and $1.90 a day are 87 and 22.5 percent respectively. This has exposed a deep poverty in which even the upper decile populations have relatively low incomes (Anikin & Tikhonava, 2016). In order to pull Indian's out of poverty and protect those vulnerable to poverty, social protection schemes have been implemented.

This note will focus on social protection systems such as the Mahatma Gandhi National Rural Employment Guarantee Act (NREGA) and the Public Distribution System (PDS) which the Indian government has used to invest into poverty alleviation. Are these programs effective in their purpose, or should India adjust social protection policies? Both programs attempt to increase livelihoods and increase income inclusivity for women, Scheduled Castes/Scheduled Tribes, and rural impoverished people. NREGA focuses on providing job creation in rural areas to increase income and PDS subsidizes the cost of food to incentivize the use of income to pull families out of poverty. These programs are far from perfect as there are major limitations such as lack of access and corruption, but the literature provides evidence of positive impacts. This note will continue testing those protections, honing in on the impacts PDS has on monthly household food expenditures (MHFE) and monthly per capita expenditures (MPCE), specifically the impacts on different social groups.

Social Protection Literature Review

NREGA was enacted by legislation in 2005 in order to provide rural impoverished citizens with job opportunities specifically combating income inclusivity among women, Scheduled Castes, and Scheduled Tribes. The goal of the program is to provide NREGA cardholders 100 days of employment annually specific to unskilled labor or semi-skilled labor. Jobs worked have often been in agriculture and construction and the program has attempted to set a Rs.100 daily minimum. There have been three phases of the program, the first launched in 200 districts (2006), the second in 130 (2007), and the third in 285 (2008) (UCLG, 2020). Most NREGA members are farmers, Scheduled Castes and Scheduled Tribes represent 47 percent of total person days worked, and women represent 54 percent. Though the average achievement in 2014 for days worked per person was 50 days, less than the 100 guaranteed, the average daily wage has risen to Rs. 144 (UCLG, 2020). As of 2016 the total program expenditures are over 46 billion USD and by 2011 over 55 million households were provided work by the program (Gehrke, 2017). The program is essential in combating rural poverty and has a great deal of support for its income inclusivity.

Using the National Sample Survey Organization data from 2006 to 2009, Bose (2017) conducted a difference in differences study consisting of a treatment of households in early implementation and a control group consisting of households in 209 late implementation districts. The study provided evidence on the national level that the NREGA program increased consumption expenditures between 6.5 and 10 percent over the 2006-09 time period. The study also found that NREGA increased rural marginalized caste household per capita consumption by 12 percent. There has even been evidence that NREGA impacts on the national level increase the probability that a female casual worker being engaged in public work increased by 4 percentage points in NREGA districts compared to non-NREGA districts (Azam, 2012). These studies aim to provide evidence that NREGA is decreasing caste-based inequalities which generate horizontal inequality through multiple generations (Stewart, 2009).

Drilling down to a 4013-household panel from Andhra Pradesh gives insight into how important state by state implementation of the program can give greater positive impacts. NREGA attempts to provide 100 working days, but the average job card holder days worked is 39 in 2015 (Deininger and Liu, 2019). Andhra Pradesh average working days are above 39 and female labor accounted for 63 percent of NREGS labor. The panel study provided evidence that the NREGA participants in phase 1 districts had a significant increase in accumulation of nonfinancial assets and energy and protein intake by 16 and 6.9 percent respectively between 2006-08. The impacts of the program districts in phase 2 and 3 increased consumption expenditures by 8.7 percent in poor households. And most importantly, poor SC/ST households, along with female headed households, benefited from an increase in energy intake by 12.2 and 18.7 percent respectively, providing further evidence in the program's benefit for income inclusivity (Deininger & Liu, 2019). Andhra Pradesh is a great example of how effective NREGA is, but state by state implementations are different and lead to significantly different results. Instead of local village leadership, Andhra Pradesh used state hired field assistance to implement and monitor program activities. NREGA is not without its deep limitations that many have criticized.

Desai, Vashishta, and Joshi (2015) provide evidence of one of the major limitations of NREGA, as 70 percent of India's poor want to work, but there is a supply-side constraint. Due to the lack of construction projects or farmers increasing land cultivation (use of unskilled farm laborers), the number of days worked is significantly lower than the 100 days per person target. That, coupled with lack of top-down monitoring, has also led to increased corruption. Rent seeking from the supply side paying workers is very common and over-reporting days worked alongside skimming from wages paid has been the largest criticism of the program (Niehaus & Sukhtankar, 2013a). Though top-down monitoring at the state level has not improved, corruption is being negated by the 2013 implementation of Direct Benefit Transfers in which the Indian government directly deposits payments for multiple programs into beneficiary's bank accounts.

The Public Disruption System (PDS) has the same intended impact of reducing poverty, but through subsidized food. Government distribution and storage grains are given to PDS shops which sell at the subsidized rate. More recently the National Food Security Act has given 75 percent of rural and 50 percent of urban household's access to five kilograms of food grain per person per month. The two options to receive this subsidy are as a direct household cash transfer from the government or the purchase of grains from PDS shops which charge a sale fee per

kilogram. This program provides poor households the opportunity to increase monthly per capita consumption of food items and has increased calorie intake (Aayog, 2016). There are a few types of ration cards such as a card for those below the poverty line. Antyodaya for those who are the poorest, below the poverty line (BPL), and other specific targeted and priority cards. The average subsidy is Rs.2 per kg. for wheat and Rs.3 per kg for rice (DFPD, 2020). Income transfers through PDS has saved 12.1 million persons from poverty and the average impact on the 2004 to 2005 poverty gap for Antyodaya and BPL card holders was 5.96 and 2.27 percentage points respectively (BPL; Kumar et al., 2014). Using 2011-12 National Sample Survey data PDS has had positive impacts on monthly per capita expenditures (MPCE) in 17 major states. Subsidies for rice and wheat combined increased MPCE from Rs. 537 to Rs. 540 for the poorest deciles (decile 1) of the study, with a clear bias in effect for urban areas (Thomas & Chittedi, 2019). Again, these programs are not without their limitations and inefficiencies.

PDS has been heavily scrutinized for being ineffective and fueling heavy corruption. A few major barriers are that large amounts of food don't make it to intended recipients as there are leakages throughout various points in the supply chain including storage where grains may sit for years before being distributed or ghost/multiple ration cards are used to fuel corruption (Aayog, 2016). It is estimated there were over 230 million excess cards across India in 2006 and in some cases, of every 5.43 kgs of PDS rice and 8.21 kgs of sugar distributed, only 1kg of each actually reaches those in need (Neetu & Mckay, 2019). There has also been a barrier to entry for vulnerable groups in which cannot get access to ration cards.

Data and Methodology

Using the 68th round of the Household Consumer Expenditure Survey (HCES), this note will test the impacts PDS has on household monthly food expenditures (HMFE) as well as monthly per capita expenditures (MPCE). HCES provides data in order to compare PDS cardholders against non-card holders to verify if the program has had positive impacts to poverty alleviation and increase food intake from 2011-12. In order to understand impacts on poverty alone, the MPCE data only represents individuals under the 2011-12 poverty line of urban and rural poverty, which are Rs.2477 and Rs.1287 respectively (India Planning Commission, 2013).

$$HMFE\ and\ MPCE\ = \beta_0 + \beta_1 Socioeconomic._i + \beta_2 PDS\ Card\ Holder._i + \varepsilon_i$$

Not only will this note test PDS general impacts on poverty, but it will include socioeconomic fixed effects such as religion, state, and cardholder type. These socioeconomic variables give more refined results to compare different living conditions within India. The impacts of PDS on Social Type is also tested to compare PDS impacts on social equality of Scheduled Tribes/Scheduled Caste.

Descriptive Statistics and Model Results

Figure one provides a representation of the socioeconomic control variables as well as the independent variables MHFE and MPCE within the sample data. The sample data for MHFE has

101,622 household observations and MPCE has 275,063 individual observations (those under the poverty line). Urban areas represent 28 percent of the data with an average MHFE of Rs. 7,609 and average MPCE of Rs. 1,354. Rural areas represent 72 percent of the data with an average MHFE and MPCE of Rs. 7,266 and Rs. 915 respectively. As for social group type Scheduled Castes represent 17 percent of the data, Schedules Tribes represent 13 percent of the data, Other Backwards Classes represent 41 percent, and Other represents 29 percent. Social group types have relatively similar MHFE apart from Other with an average MHFE and MPCE of Rs.7,718 and Rs. 1,222 respectively. Figure one also gives sample data representation of average MHFE and MPCE by religion and ration card type. The most predominant religion in the dataset is Hinduisms followed by Islam. Ration card type is predominantly other and BPL representing 59 and 36 percent respectively and have a much higher average MHFE and MPCE than Antyodaya (Rs. 6,656 and Rs. 901 respectively).

Table one breaks down average MHFE for PDS cardholder vs. non-PDS cardholder by religion, sector, and social type. The MHFE mean difference for social type shows that card holders expended Rs. 528 more than non-card holders. One interesting analysis is that the Scheduled Tribes mean difference for card holders is Rs. 181 less than non-cardholders. This table demonstrates the inequality among social group types, biased PDS system use in urban areas, and large use of PDS cards for Indian Hindu's. Though there are clear PDS cardholder benefits in 2011-12 for MHFE, there are fewer clear signs of positive trends for MPCE. Table two provides a mean difference analysis of religion, sector, and social type for card holders and non-holders. The only two subgroups who had a card holder mean greater than non-card holder for MPCE was Buddhist and Rural populations which were Rs. 63 and Rs. 9 respectively.

Table three provides evidence that PDS has significant positive impacts on MHFE. Card holders expended an average of Rs. 381 more on foods when controlling for religion FE and Rs. 365 more when controlling for state FE at a significance level of 1 percent. But when controlling for Antyodaya card holders, the poorest card holders expended Rs. 369 less than poorest non-card holders (significant at the 1 percent level). This trend may demonstrate the limitations of PDS through lack of access and leakages may have a negative impact on the poorest card holders. Table four drills down into PDS impacts of HMFE for each social type. The greatest positive impacts for social group card holders are "other", which expends Rs. 527 more on food than "other" non-card holders at a 1 percent level significance. Scheduled Tribes are the only social group to have a negative impact for scheduled tribe card holders vs. Scheduled Tribe non-card holders of expending Rs. 192 less on food (significant at the 1 percent level). The results as a whole demonstrate a trend of unequal access to pull PDS resources by social type and strong positive correlation for urban households.

As for PDS card holder impacts on MPCE, Table five shows strong negative correlations stating card holders below the poverty line spend less per capita at the individual level than non-card holders below the poverty line. When controlling for religion and state card holders, monthly per capita expenditures are Rs. 11 and 4.6 less respectively. The Antyodaya or poorest card holders also significantly spend 145 less per capita than non-card poor card holders. As the data sample only contains those under the poverty line, there is a clear trend of either ineffective program benefits or those under the poverty line might be using the program to save more and spend less on general expenditures. MPCE of card holding Scheduled Tribes expended Rs. 124

less than Scheduled Tribe non-card holders at a 1 percent significance level. Between the negative PDS impact on Scheduled Tribes for HMFE and MPCE, there demonstrates a clean inequality within the PDS program.

Limitations

The limitations of the model tested need to be considered. There is only one year of data which limits the growth over time for the PDS program and limits the ability to conduct a DID. There are also limits within the control variables, such as examining female heads of households, cardholders with disabilities, amount of state monitoring of the program, and other variables that can give a deeper analysis. Causation between the independent and dependent variables cannot be provided and further analysis is needed to see how the PDS program really impacts HMFE and MPCE on impoverished Indians over time.

Conclusion

The literature review provides strong evidence of the positive impact the NREGA program has on rural income generation, specifically on those traditionally plagued by income inequalities such as women and social types. NREGA has been proven to increase expenditures and savings to provide upward mobility for those in poverty. But the program is not without its limitation as the goal of 100 days per person per year has not been met, and state effectiveness is highly volatile. Strong state legislation and monitoring needs to be implemented in order to increase the effectiveness of the program and more so now that COVID-19's negative shock on employment is currently hurting India. Though Indian government has implemented direct deposit programs to decrease corruption and leakages, further analysis is needed to verify those program impacts are positive.

PDS analysis has a varied outcome. There are many critics of the program and rightfully so. Corruption from ghost cards, leakages, and quality of food subsidized has severely limited the positive impacts over time for this program. The literature review uses the same dataset as the one tested in the model but only included certain states and does not breakdown the data further. The NREGA program has positive impacts for income inclusion for women and social types, but the PDS impacts analyzed from the 68th round of the Household Consumer Expenditure Survey provides evidence that PDS does not decrease the inequalities between social groups. The model tested even provided evidence that those social types in poorest of the poor who are PDS card holders expend less on foods and monthly per capita expenditures than non-card holders. Leakages and government inefficiencies within food quality coupled with access, limit the impact made for those poor group types specifically with Scheduled Castes who have the largest inequalities of expenditures compared to others social group types. More analysis of the PDS program over time needs to be conducted. Panel data can give further analysis rather than a snapshot on if the program is increasing or decreasing impacts over certain time periods. Given more data, better policy can be implemented to control for the inequalities of social types and efficiencies for the poorest of the poor under the poverty line.

Appendix: Table and Figures

Figure 1

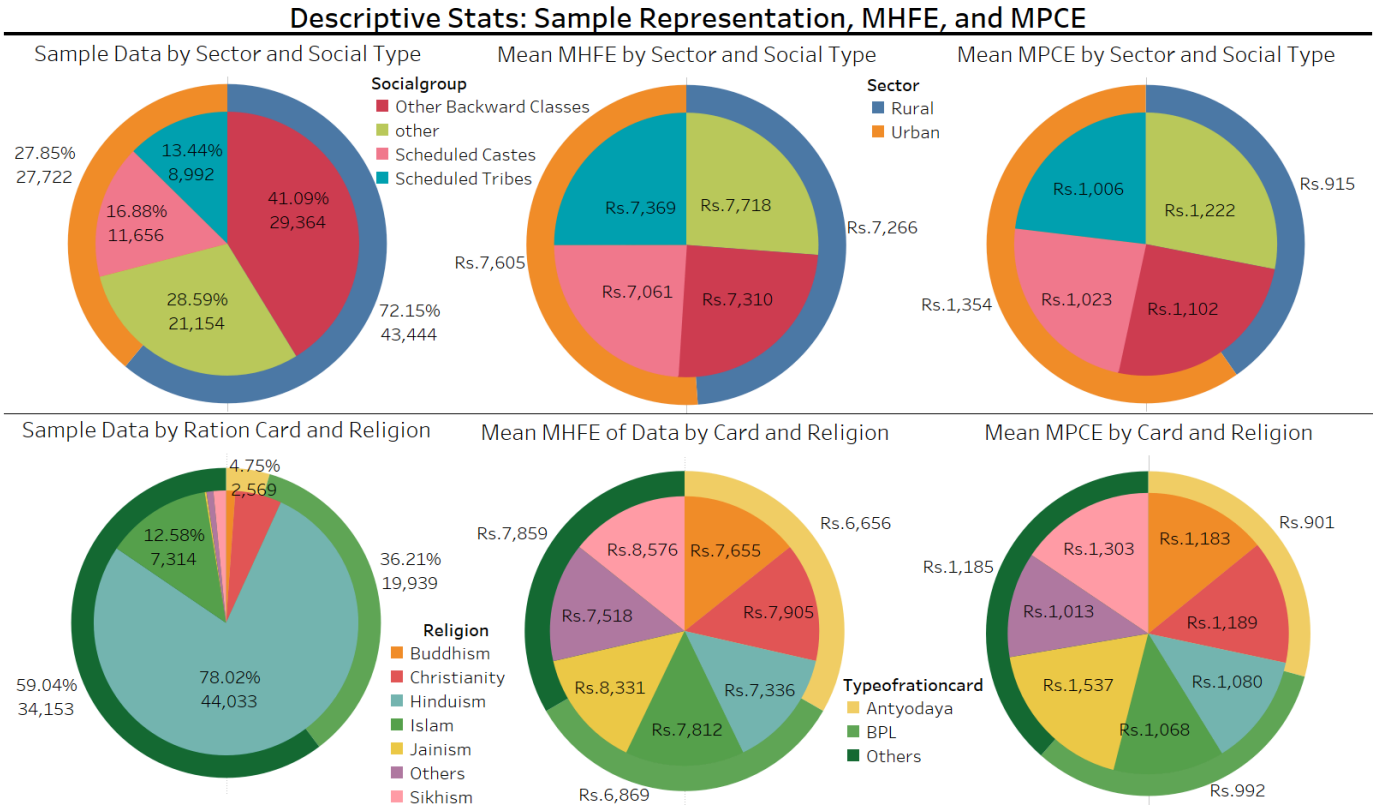

Table 1 Descriptive Statistics for Ration Card Holder and Non-holder: Monthly Household Food Expenditures (MHFE)

Variable	Ration Card Holder (1) Frequency	Ration Card Holder (1) Mean Rs.	Non-Ration Card Holder (0) Frequency	Non-Ration Card Holder (0) Mean Rs.	Mean Difference
Religion					
Buddhism	633	7667	165	6888	779
Christianity	3226	7905	1236	8098	-193
Hinduism	44050	7336	11168	7041	295
Islam	7321	7811	1527	7258	553
Jainism	125	8366	37	7840	526
Others	479	7512	175	7303	209
Sikhism	861	8575	159	8091	484
Sector					
Rural	36971	7305	6472	7042	263
Urban	19725	7741	7996	7271	470
Social Type					
Other	16548	7833	4603	7305	528
Other Backward Classes	23649	7368	5710	7068	300
Scheduled Castes	9545	7116	2111	6814	302
Scheduled Tribes	6947	7328	2042	7510	-182

Table 2 Descriptive Statistics for Ration Card Holder and Non-holder: Monthly Per Capita Expenditures (MPCE)

Variable	Ration Card Holder (1) Frequency	Ration Card Holder (1) Mean Rs.	Non-Ration Card Holder (0) Frequency	Non-Ration Card Holder (0) Mean Rs.	Mean Difference
Religion					
Buddhism	1657	1183	402	1120	63
Christianity	8559	1190	2763	1241	-51
Hinduism	131709	1080	28929	1187	-107
Islam	27658	1068	4993	1113	-45
Jainism	295	1544	50	1676	-132
Others	1502	1012	595	1091	-79
Sikhism	1504	1303	241	1360	-57
Sector					
Rural	103539	916	16921	907	9
Urban	69345	1340	21052	1400	-60
Social Type					
Other	42190	1200	10008	1314	-114
Other Backward Classes	73271	1090	15896	1160	-70
Scheduled Castes	33492	1010	6523	1090	-80
Scheduled Tribes	23931	983	5546	1103	-120

Table 3 PDS Impacts on Monthly Household Food Expenditures (MHFE) with Fixed Effects

VARIABLES	(1) HMFE	(2) HMFE	(3) HMFE
pdsdummy	381.734***	365.913***	-369.478***
	(19.201)	(19.885)	(14.562)
Scheduled Castes	-108.156***	-68.063**	-240.058***
	(31.078)	(31.464)	(31.854)
Other Backwards Castes	133.159***	224.682***	-29.592
	(27.892)	(28.294)	(27.902)
Other	472.844***	481.585***	398.557***
	(29.155)	(29.257)	(29.445)
Urban	339.545***	288.080***	373.118***
	(15.942)	(16.090)	(17.983)
Antyodaya			-732.601***
			(39.212)
Observations	71,154	71,155	56,661
Adjusted R-squared	0.036	0.073	0.029
Religion FE	Yes	No	No
State FE	No	Yes	No
Poorst of Poor FE	No	No	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 PDS Impacts on Monthly Household Food Expenditures (MHFE) by Social Group

VARIABLES	(1) MHFE	(2) MHFE	(3) MHFE	(4) MHFE
pdsdummy	-182.652***	302.023***	300.297***	527.635***
	(52.772)	(47.833)	(29.618)	(34.020)
Observations	8,989	11,656	29,359	21,151
Adjusted R-squared	0.001	0.003	0.003	0.011
Scheduled Tribes	Yes	No	No	No
Scheduled Castes	No	Yes	No	No
Other Backward Classes	No	No	Yes	No
Other	No	No	No	Yes

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5 PDS Impacts on Monthly Per Capita Expenditures (MPCE) Fixed Effects

VARIABLES	(1) MPCE	(2) MPCE	(3) MPCE	(4) MPCE	(5) MPCE
pdsdummy	-79.923***	-11.383***	-4.684**	-48.159***	-
	(2.442)	(2.052)	(2.037)	(2.077)	
Scheduled Castes		-59.089***	-7.912***	4.247*	-44.363***
		(2.398)	(2.598)	(2.522)	(2.573)
Other Backwards Castes		-7.575***	64.891***	66.824***	0.302
		(2.108)	(2.352)	(2.244)	(2.275)
Other		94.607***	177.611***	157.041***	101.205***
		(2.365)	(2.651)	(2.525)	(2.551)
Urban		483.023***	477.705***	417.522***	469.478***
		(1.568)	(1.563)	(1.580)	(1.741)
Antyodaya					-145.150***
					(2.839)
Observations	275,063	275,035	275,031	275,035	227,332
Adjusted R-squared	0.004	0.310	0.325	0.372	0.316
Religion FE	No	No	Yes	No	No
State FE	No	No	No	Yes	No
Poorst of Poor FE	No	No	No	No	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6 PDS Impacts on Monthly Per Capita Expenditures (MPCE) by Social Group

VARIABLES	(1) MPCE	(2) MPCE	(3) MPCE	(4) MPCE
pdsdummy	-124.524***	-65.058***	-66.550***	-77.645***
	(5.736)	(4.975)	(3.407)	(4.773)
Observations	39,604	49,682	114,811	70,938
Adjusted R-squared	0.012	0.003	0.003	0.004
Scheduled Tribes	Yes	No	No	No
Scheduled Castes	No	Yes	No	No
Other Backward Classes	No	No	Yes	No
Other	No	No	No	Yes

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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