INTER-STATE COMPARISON OF PERFORMANCE IN MGNREGA (2011-2018) AND PMGSY (2000-2018)

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Farzana Afridi
Amrita Dhillon
Arka Roy Chaudhuri

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PREFACE

This report is based on publicly available data on MNREGA for the period 2011/12-2018/19, and PMGSY for the period 2000/01-2018/19. The Government of India (GoI) revised average budget of MGNREGA over this period has been INR 40867 crore per year while for PMGSY it has been INR 8949 (till 2016-17) crore per year. How efficiently have states used this budget?

We create some indicator variables to measure the performance of 19 major states both on average over the period and how they evolve over the whole period. In particular, we test for whether states are converging over time. We also link the findings to measures of state capacity, development, HDI and corruption.

Our main findings are summarised in this report.

1. MGNREGA

- Our main indicator variables for MGNREGA fall into the following two categories:
- (1) those measuring *coverage*- what proportion of those who demand work actually receive it? What is the yearly average expenditure on MGNREGA per program participant?
- (2) those measuring *intensity* – what is the average number of days worked per participant and what is the average yearly expenditure per program participant? We use these indicators to construct a composite index[1] that can be used to rank states.
- On average states perform badly with a median composite score of 0.27 (on a scale of 0 to 1)– however there are a few star performers: Kerala being the best at 0.9, HP and TN are second at 0.5 and AP, Rajasthan and Uttarakhand are at 0.35. The worst performers are Bihar, Gujarat, Karnataka, Assam and UP.
- On average states perform badly with a median composite score of 0.15 (on a scale of 0 to 1)– however there are a few star performers: Kerala being the best at 0.9, HP and TN are second below 0.7 and AP, Rajasthan and Uttarakhand are below 0.5. The worst performers are Bihar, Gujarat, Karnataka, Assam and UP.
- States are converging over time in the composite intensity indicator. However, we do not see evidence of convergence in the other MGNREGA indicator variables.
- Kerala, W. Bengal and Punjab are the most improved while UP and Haryana are the least improved.

2. PMGSY

- Our main indicator variables for PMGSY are *Completion rates* for new roads and upgradations, *Cost efficiency* – expenditure per km of completed road in constant prices – for new works and upgradations, a composite of the two, *contractor concentration index*, *delay coverage*: proportion of completed projects that were delayed, *delay intensity:* average delay per km within delayed projects, a composite of the two, *quality coverage:* the proportion of road length that was inspected at least once by NQM or SQM,; *quality intensity* - the proportion of roads that were graded satisfactory, and a quality composite. Based on all the composites we also calculated an overall composite.
- The highest new road completion rate is 71% till March 2019 (W. Bengal). The median is 43% and the lowest is only 13% (Karnataka).
- However, Karnataka is highly cost efficient and builds at less than a third of the worst performing state (Assam). Rajasthan and HP are also at the top. Assam is an outlier with very low cost efficiency (INR 30.55 lakh per km). In general states which build new roads at high cost efficiency also tend to upgrade at higher efficiency.
- The project is beset with delays. The best performing state, Gujarat, has 49% of works delivered late. Most states have over 80% of projects delivered late. Kerala, Assam, and Bihar have very high rates of delay, among the delayed projects - above 187 days while 12 of the 19 states have delays of over 100 days per km.

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[1] All composites are geometric means

- Quality coverage shows high variation across states. Over 80% of road length was inspected in W Bengal but only 15% in Haryana. Gujarat has the highest percentage (93%) of inspected road length showing a satisfactory rating, followed closely by Kerala (92%), Tamil Nadu (89%) and Uttarakhand (88%); while Bihar saw the lowest (63%).
- Most states have very fragmented markets with low contractor concentration suggesting that it is difficult to find capable contractors at the district level.
- Overall, no state ranks consistently high in all indicators. Gujarat however does the best on the overall composite index.
- Over time there are no clear trends for PMGSY- there is a lot of volatility in indicators, perhaps due to the lumpiness of road building but also due to missing values.

3. EXPLAINING THE PATTERNS

- We considered four plausible variables to explain why there is so much variation across states in performance indicators.
- A simple correlation analysis between values of the MGNREGA and PMGSY success indicators and those of the 2001 administrative capacity indicators at the district level shows that there is a strong positive correlation for all indicators except cost efficiency and quality coverage indicators for PMGSY.
- The correlations between the corruption indicators and performance indicators are broadly negative suggesting that higher corruption is correlated with lower performance.
- We also show that HDI and per capita income are positively correlated with performance indicators as expected. Note that all these variables are themselves highly correlated and just capture different levels of state capacity.

4. POLICY PRESCRIPTIONS

- States that did well are those that have higher state capacity at the district level. It is important to develop ways to monitor district administration.
- Lower perceptions of corruption, and higher perceptions of the competence of governments in reducing corruption are linked to better performance.
- To improve monitoring, it is key to make both central and social audit data available so as to enable linking performance to objective measures of corruption, ensuring greater accountability.

INTRODUCTION

The National Rural Employment Guarantee Act (NREGA, 2005) mandates the provision of a hundred days of manual work on publicly funded projects to rural households in India. The Act envisions a rights-based approach: adults in rural areas can demand work at a mandated minimum wage. The program was initially implemented in the country's poorest 200 districts in February 2006, with 130 additional districts added in the next stage (2007) and national coverage thereafter (2008).

While the primary objective of the program is social protection through the provision of employment, it also aims to create durable assets for the community, as a whole (e.g., irrigation canals, ponds for water conservation, development of land for cultivation by socially disadvantaged groups and other rural infrastructure) and for socio-economically disadvantaged individuals . Unlike the typical government transfer programs which either provide public goods (e.g., road construction) or private goods (e.g., subsidized food grains and school meals), the MGNREGA is unique in delivering both types of goods.

A novel feature of the MGNREGA, unlike all other public programs in India, is mandated audits of program expenditures at the village level. Grass roots institutions, i.e., directly elected village, sub-district, and district level governments (or panchayats) under India's decentralized system of governance, have a leading role in the planning and implementation of MGNREGA works. The central government pays all labour related costs (mandated to be 60% of costs) while states pay the materials costs (mandated to be 40% of costs). (Afridi, 2016)

PMGSY was launched in 2000 to improve rural road connectivity. The goal was to provide all-weather roads to connect eligible (villages with population over 500 in general) unconnected habitations. It is a centrally sponsored scheme and the budget is borne entirely by the central government, funded via the tax on diesel.

Over the eighteen years from 2000-2018, more than 180,000 all-weather roads were constructed. The total road length was 550,000+kms at a cost of USD 40 billion (Goyal, 2019)

In this report, our objective is to evaluate both these programs at the state level. We create new indicator variables based on publicly available data to compare state performance and provide a ranking of states.

First, as noted in the World Development Report 2015, rankings of states may help to shift state actions through the use of status incentives. Second, the patterns that emerge from state comparisons help to understand the criteria for success and failure and suggest which states could be treated as models for implementation. We focus especially on administrative capacity and accountability as two key factors that affect success.

DATA

We obtain our core data on MGNREGA from the MGNREGA Public Data Portal[2] scraped in May 2020. We restrict our analysis to 19 major states - Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal.[3] Moreover, we restrict our analysis to the years 2011-12 to 2018-19 (both inclusive). We also use data from the 68th round of the National Sample Survey in conjunction with state-level poverty line estimates for 2011-12 contained in the Tendulkar Committee Report to estimate poverty rates as well as Consumer Price Index (Rural Labourers) state series released by the Labour Bureau of the Ministry of Labour and Employment, Government of India.

We obtain our core data on PMGSY from its Online Management, Monitoring and Accounting System.[4] We restrict our analysis to19 states, as with MGNREGA. However, unlike with MGNREGA data, the geographical area forming present-day Telangana is available for PMGSY. We incorporate data for Telangana into Andhra Pradesh for the entire period, so that geographic borders of states in our sample stay constant over time. Our data contains details on all works sanctioned up to financial year 2018-19. Lastly, we restrict ourselves to PMGSY-I, since it has been in existence since 2000 and therefore provides a longer time-span for analysis relative to the later programs.[5]

Data for corruption indicators is taken from Centre for Media Studies (CMS)-India Corruption Study 2017, Transparency International's India Corruption Survey 2005 and data contained in (Debroy, 2010).

The first data set, CMS-India Corruption Study 2017, covers both rural and urban locations in 20 states, capturing corruption prevailing in the G2C (Government to Citizen) phase. It captures people's Perception (P) and Experience (E) with Public Services. It further Estimates (E) the amount paid as bribe by citizens to avail public services during the previous year. We use variables like the percentage of citizens who have heard about RTI in 2007 along with percentage of households that have experienced corruption in 2005 from this study.

The second data set, Indian Corruption Study 2005, focuses on petty corruption experienced by the common man in availing of public services. This study contains a sample of 14,405 respondents, spread over 151 cities and 306 villages of 20 states. We have taken two corruption indicators from this survey: composite corruption score and mean direct experience of bribing.

The last data set from (Debroy, 2010) has state level variations on anti-corruption efforts brought out with the help of an index constructed using data from 4 five year periods – 1990-95, 1996-00, 2001-05, and 2006-10.

Data for HDI and per capita NSDP are taken from Global Data Lab[6] and the Ministry of Statistics and Programme Implementation respectively.[7]

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[2] https://nregarep2.nic.in/netnrega/dynamic2/DynamicReport_new4.aspx scraped in May 2020.

[3] We exclude the Union Territories, the North-Eastern states (except Assam), Goa and Jammu & Kashmir. We exclude Telangana since data for Telangana is missing from the MGNREGA Public Data Portal. Consequently, we exclude data on the geographical area forming present-day Telangana from the Census 2011 data we use to calculate our indicators.

[4] http://omms.nic.in; scraped in April 2020

[5] PMGSY–II envisages consolidation of the existing Rural Road Network to improve its overall efficiency as a provider of transportation services for people, goods and services.

[6] https://globaldatalab.org/shdi/shdi/

[7] http://mospi.nic.in/

INDICATORS OF PROGRAM SUCCESS (MGNREGA)

Any indicator of MGNREGA performance must attempt to measure how well the program has fulfilled its stated objectives. The Preamble to the National Rural Employment Guarantee Act, 2005m states its main objective clearly:'to provide for the enhancement of livelihood security of the households in rural areas of the country'. It also allows for secondary objectives:'and (to provide) for matters connected therewith or identical thereto'.

The Program's operational guidelines list seven secondary objectives: (i) social protection for the vulnerable among the rural population, (ii) creation of durable assets, improved water security, soil conservation and increasing land productivity, (iii) drought proofing and flood management, (iv) empowering the socially disadvantaged, including women, Scheduled Castes (SCs) and Scheduled Tribes (STs), (v) strengthening decentralised planning, (vi) strengthening Panchayati Raj Institutions, and (vii) increasing transparency and accountability in governance. Clearly, all the program objectives (primary and secondary) can be influenced by the success and failure of other government interventions. Any indicator that attempts to measure how well any of these objectives have been fulfilled will, therefore, capture the success of government interventions beyond MGNREGA, and cannot be used as an indicator of MGNREGA success alone.

However, the preamble to the Act also states the means by which its objectives are to be met – 'by providing at least one hundred days of guaranteed wage employment in every financial year to every household whose adult members volunteer to do unskilled manual work'. The extent to which the demand for work under the Act was fulfilled is conceptually measurable and specific to MGNREGA. Thus, we focus on these intermediate objectives.

Demand for work under the Act has two facets - coverage, i.e., the number of people requesting work; and intensity, i.e. the quantum of employment demanded by the various potential participants. Official statistics record the numbers of people who demanded and received work. However, there are some limitations of official data on demand fulfilled.[8] Thus, we derive alternative indicators of program success.

First, poverty rates are commonly used as a proxy for the underlying demand for MGNREGA work.[9] The program is self-targeting, the character of the work is manual labour and the wage rate is extremely low, leading to the obvious conclusion that poor people would be the prime driver of demand. States with a higher proportion of poor, therefore, would be expected to have a higher underlying per capita demand for MGNREGA work. Second, there is an attempt to evaluate how well the Program performs for socially disadvantaged groups, especially women.[10] While we acknowledge that the quality of the assets created under MGNREGA is important, our access is limited to official statistics, which contains no useful information about asset quality.

Consequently, we derive four base indicators to measure different aspects of MGNREGA coverage and intensity.

> 1. **Demographic Coverage**, defined as the yearly average of total persons worked under the program as a proportion of the 2011 rural adult population below the poverty line. We use official MGNREGA data to derive the yearly total persons worked; 2011 Census data to calculate the total number of rural adults; data from the 68th round of the National Sample Survey in conjunction with state-level poverty line estimates for 2011-12 contained in the Tendulkar Committee Report to estimate poverty rates.

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[8] See e.g., (Anderson, 2013), (Dutta, 2012) and (Khera, 2011)
[9] (Chakraborty, 2007); (Ghosh, 2013).
[10] (Bonner, 2012).

2. ***Financial Coverage***, defined as the inflation adjusted average yearly expenditure per 2011 rural adult below the poverty line. We use official MGNREGA data to derive total yearly expenditure, and adjust for inflation to 2011-12 prices using the Consumer Price Index (Rural Labourers) state series released by the Labour Bureau of the Ministry of Labour and Employment, Government of India.

3. ***Demographic Intensity,*** defined as the average number of days worked per program participant. We obtain both the total number of days worked and the total number of persons worked from official MGNREGA data.

4. ***Financial Intensity,*** defined as the inflation adjusted average yearly payment per program participant. We obtain both the total yearly expenditure and total number of persons worked from official MGNREGA data.

We also derive *composite indicators* which combine two or more of the base indicators. Since the four base indicators are all expressed in different units, we first normalize them using the formula $\frac{Value - Benchmark}{Max - Benchmark}$, analogous to the formula used to derive the dimension indices of the Human Development Index. We choose the most appropriate benchmark for each case. Indices so calculated are unitless, lie between 0 and 1, and retain both the ordering and relative distance between different values and the benchmark. The composite indicators are calculated as geometric means of various constituent indices, analogous to the Human Development Index calculation. Due to its concavity, the geometric mean does not treat its constituents as perfect substitutes and rewards consistent performances across constituents. We set the benchmark to be the (empirically found) minimum value of the corresponding indicator. We calculate three composite indicators.

a) ***Composite Coverage***, with the Demographic Coverage and Financial Coverage indicators as constituents.

b) ***Composite Intensity***, with the Demographic Intensity and Financial Intensity indicators as constituents.

c) ***Composite Overall***, with all four base indicators as constituents.

Additionally, we also derive three indicators measuring how well the program has targeted disadvantaged groups, focusing on SCs and STs. Since official MGNREGA data does not separately measure payments to SC and ST households, we cannot calculate financial indicators and must restrict ourselves to demographic indicators.

Demographic Coverage (SC-ST), defined as the yearly average of the total number of SC and ST households which participated as a proportion of the total number of SC and ST households below the poverty line in 2011. We obtain the number of SC and ST *households*[11] participating from official MGNREGA data and the total number of SC and ST households from 2011 Census data. We use data from the 68th round of the National Sample Survey in conjunction with state-level poverty line estimates for 2011-12 contained in the Tendulkar Committee Report to estimate poverty rates.

Demographic Intensity (SC-ST), defined as the average days worked per participating SC and ST household. We obtain both the total days worked by SC and ST persons and the total number of participating SC and ST households from official MGNREGA data.

Composite Demographic (SC-ST), with the two previous indicators as constituents.

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[11] We cannot calculate the indicator analogous to the general case i.e. at the individual level since official MGNREGA data does not capture the number of SC/ST individuals receiving employment rather the data captures the number of SC and ST households receiving employment under MNREGA.

The values of the seven general indicators, as well as rankings derived from them, are presented in Table 1. Regarding the coverage indicators, demographic coverage is generally high, with several states providing employment to more persons than the total number of rural adults below the poverty line in 2011. However, there is considerable variation - the maximum (Andhra Pradesh) and minimum (Bihar) demographic coverage rates differ by a factor of 17. The financial coverage indicator also shows considerable variation, with different states spending as little as INR 1,173 or as much as INR 20,065 on average per year (in 2011 prices) per rural adult below the poverty line in 2011. Overall, four states stand out with composite indicator scores of greater than 0.75 - Himachal Pradesh, Andhra Pradesh, Kerala and Tamil Nadu. However, composite indicator values for most states are extremely low - eleven states have values of below 0.20 and eight states have composite indicator values of less than 0.09, with Bihar, Gujarat and Uttar Pradesh being the worst performers. This paints a picture of a few star performers and most states performing very poorly. The intensity indicators are far less variable, indicating a more uniform performance between states. In the demographic intensity indicator, Kerala is the standout, providing 46.52 days to each participant on average each year. Tamil Nadu, Himachal Pradesh and Rajasthan provide between 37 and 41 days, while the rest provide less than 34 days of work to each participant on average each year. Kerala is the sole standout on the financial intensity indicator, providing on average INR 7,155 to each participant every year, while the other states provide between INR 2,467 and INR 4,380. Consequently, Kerala dominates the composite intensity indicator with a value of 1.00, while all other states have values of 0.52 or lower. Five states have composite indicator values between 0.33 and 0.52, indicating average performances - Himachal Pradesh, Tamil Nadu, Bihar, Uttarakhand and Rajasthan. The worst performers are Karnataka, Gujarat, Assam and Madhya Pradesh, with composite intensity indicator values of 0.08 or lower.

Figure 1: MGNREGA Static Analysis: State Performance on Coverage and Intensity
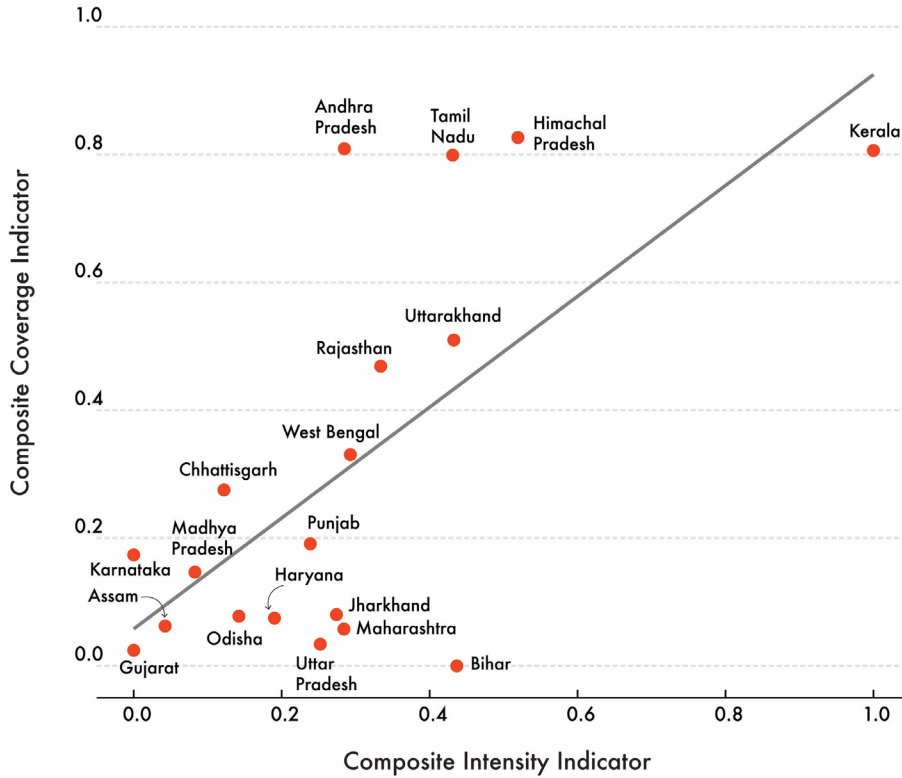

Figure 1 above shows the performance of various states on the composite coverage and composite intensity indicators. Kerala, due to its top-notch performance on coverage and stratospheric performance on intensity, is the standout. Generally, states which do well on coverage also tend to do well on intensity and vice versa. However, there are important exceptions - Andhra Pradesh performs extremely well on coverage but only average on intensity, while Bihar performs very well on intensity but extremely poorly on coverage. In terms of overall performance, Kerala is the best performing state by a large margin with a composite overall indicator value of 0.90. Only two other states - Himachal Pradesh and Tamil Nadu - have indicator values of above 0.50; and three more states - Andhra Pradesh, Uttarakhand and Rajasthan - have indicator values above 0.35. The worst performing states are Bihar, Gujarat, Karnataka, Assam and Uttar Pradesh, with indicator values of below 0.10. The median score is 0.15 (Jharkhand), painting a picture of a few good performers and many bad performers. Figures 2 and 3 next show the states performance on composite coverage and intensity:
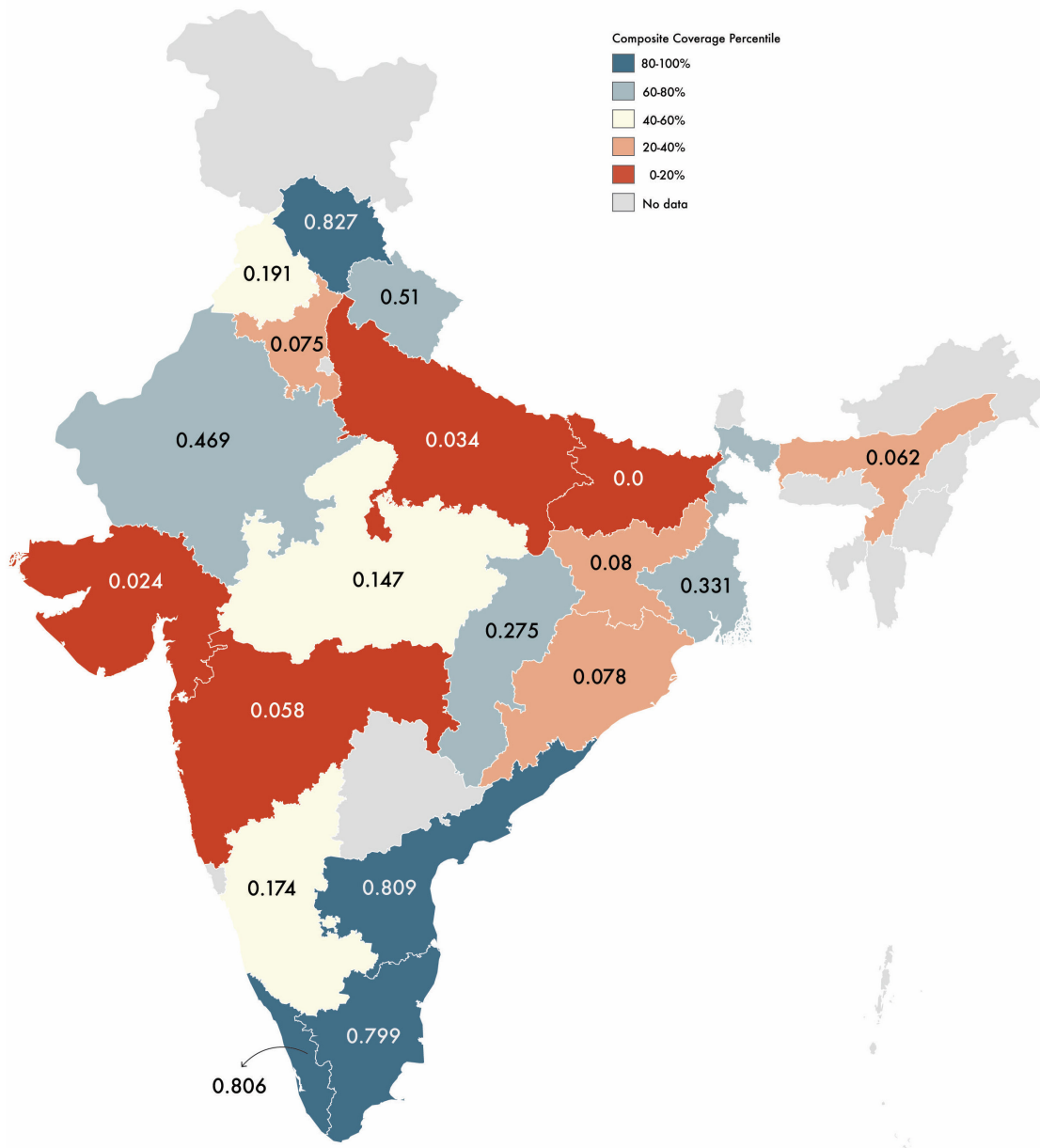
Figure 2A: Composite Coverage (General)

Composite Coverage Percentile

- 80-100%
- 60-80%
- 40-60%
- 20-40%
- 0-20%
- No data

0.827
0.191
0.51
0.075
0.469
0.034
0.0
0.062
0.024
0.147
0.08
0.331
0.275
0.078
0.058
0.174
0.809
0.799
0.806
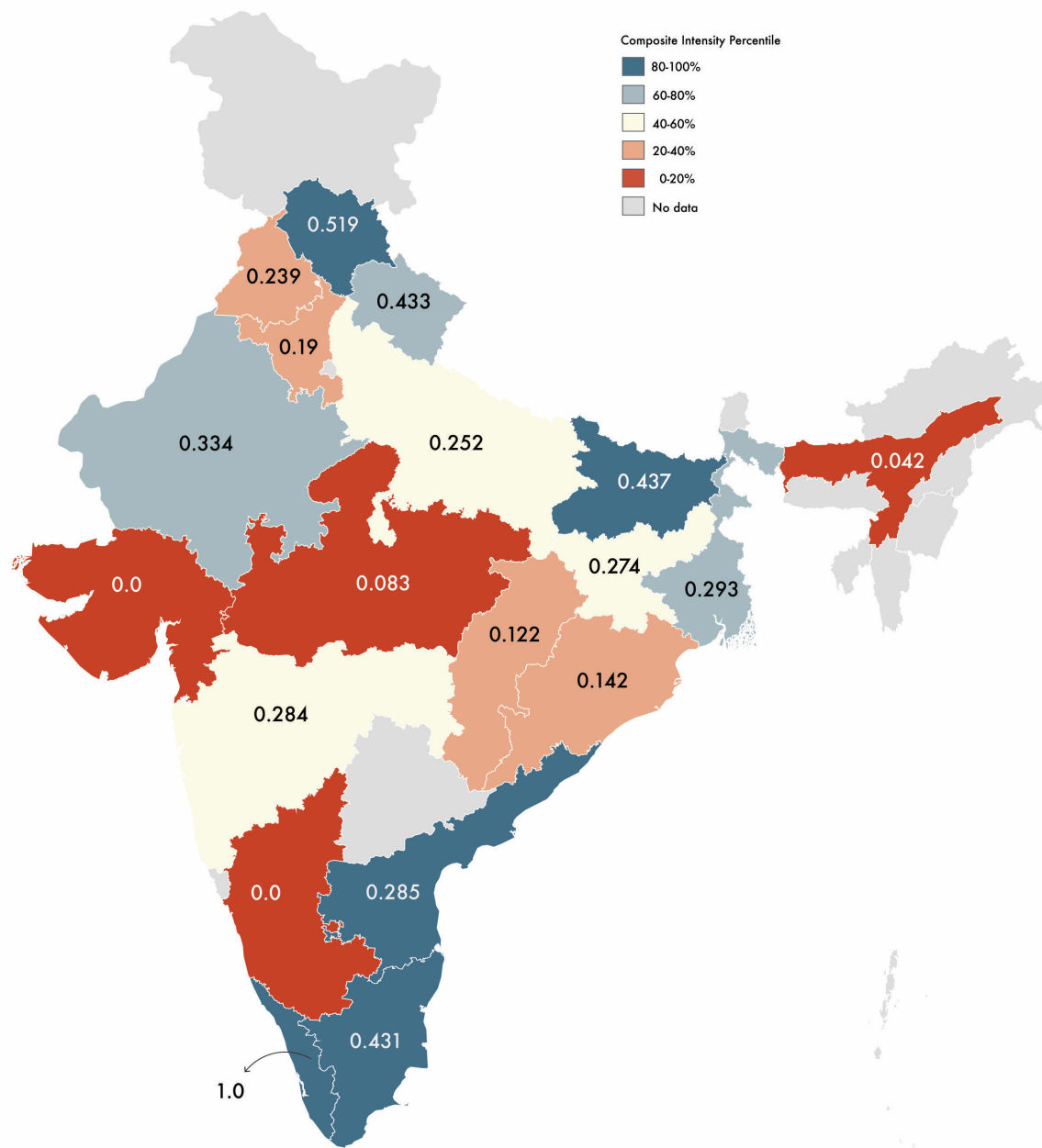
The values of the three SC-ST indicators, as well as rankings derived from them, are presented in Table 2. Andhra Pradesh has the highest proportion of SC and ST households participating to total 2011 SC and ST households at 3.09. Five states have coverage indicator values of between 1.82 and 3.01 - Himachal Pradesh, Tamil Nadu, Uttarakhand, Kerala and Punjab. In general, coverage levels are low, with a median indicator value of 0.94. Low SC and ST coverage indicates that the poorest (often SCs and STs) derive less benefit from the Act than the (lower) middle class in some states. This is in line with the results in (Liu, 2012) based on an analysis of 2009-10 National Sample Survey data. Thus, there is scope for improvement in targeting in many states. There is less variability in the intensity indicator, with maximum of 56.28 days (Kerala) and a minimum of 26.97 days (Assam) of employment provided per SC or ST household. Apart from Kerala, four other states provide over 50 days of employment per SC or ST household - Andhra

Pradesh, Tamil Nadu, Rajasthan and Maharashtra. At the other end, in addition to Assam, three other states provide under 35 days of employment per SC or ST household - Punjab, Haryana and Uttar Pradesh. While there is, in general, a positive correlation between coverage and intensity indicator values, Maharashtra stands out as an exception with a very good performance on intensity but an extremely bad performance on coverage. Tamil Nadu, Andhra Pradesh, Himachal Pradesh and Kerala are the best overall performers with composite overall indicator values of over 0.75; while Assam, Maharashtra, Haryana, Uttar Pradesh, Bihar and Gujarat are the worst, with values of under 0.20. The median value of the indicator is 0.24 (Jharkhand), indicating a fairly even distribution between good and bad performances.

Significantly, the top four performers when it comes to the SC-ST indicators are among the top six in the general case; while three of the bottom six performers on the SC-ST indicators (Assam, Bihar and Gujarat) are also in the bottom five in the general case.

Do states converge over time? Figure 4 (in the Appendix) for composite coverage shows that both Andhra Pradesh and Tamil Nadu are top performers over the entire eight-year period, but Andhra Pradesh improves the most over time whereas Tamil Nadu deteriorates the most. States that were top performers on average tend to be the ones which improve most over time except Tamil Nadu. Figure 5 (in the Appendix) suggests that there is convergence on intensity. Indeed, Table 3 below shows that there is convergence on the intensity indicators but not in coverage. This is a puzzling fact that needs further exploration.

Table 3: MGNREGA Dynamic Analysis: Beta Coefficients from Regressing Compound Annual Growth Rates on Earliest Values

Indicator	Beta Coefficient
Demographic Coverage	$-0.006\,863\,3$ (0.0105)
Financial Coverage	$-0.000\,001\,52$ (0.00000246)
Composite Coverage	$-0.056\,588\,9$ (0.0727)
Demographic Intensity	$-0.002\,659\,5^{***}$ (0.000886)
Financial Intensity	$-0.000\,016\,6^{**}$ (0.00000664)
Composite Intensity	$-0.423\,460\,6^{***}$ (0.107)
Overall Composite	$-0.146\,729\,8^{*}$ (0.0702)
SC/ST Coverage	$-0.007\,137\,9$ (0.0130)
SC/ST Intensity	$-0.001\,746\,5^{**}$ (0.000748)
SC/ST Composite	$-0.077\,461\,8$ (0.0496)

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

INDICATORS OF PROGRAM SUCCESS (PMGSY)

The PMGSY-I Program Guidelines state hat "the primary objective of the PMGSY is to provide Connectivity, by way of an all-weather Road (with necessary culverts and cross-drainage structures, which is operable throughout the year), to eligible unconnected habitations..." As a secondary objective, PMGSY-I also permitted upgrading existing roads if all target habitations in a district had been connected by all-weather roads, so long as the road being upgraded was not black- or cement-topped.

We measure five aspects of the program - completion rates, cost efficiency, contractor concentration, timeliness, and quality. We exclude indicator values derived from less than 25 underlying observations at state-year level) from our analysis as they are very unlikely to be representative. We now discuss each of the chosen indicators in detail.

1. **Completion Rates.** Given the uneven distribution of the core network among states, we focus on completion rates rather than total length. We derive three indicators of completeness: *Completion Rate (New) Indicator*, defined as the percentage of new road length required to be built to complete the core network in 2000 which have been completed as of March 2019. We use official PMGSY data to obtain both the total new road envisaged under the program in 2000 as well as the total length completed in April 2020. We excluded FY 2019-2020 because it is too recent and the data may have been updated.

Completion Rate (Upgrades) Indicator, defined as the percentage of cumulatively identified upgrade works length that have been completed as of March 2019. We obtained the total length of completed upgrade works directly from official PMGSY data.

The total length of cumulatively identified upgrade works is not directly captured in the official data. We estimate this using two separate sets of official data - one of all proposals that have been made under the program, and another of works currently identified as pending. However, there is substantial overlap between the two data sets, in that several works identified as pending also appear in the list of proposals (either pending sanction or having been approved). Moreover, the same works are not consistently named across the two data sets. We use fuzzy matching to identify and eliminate as many duplicates as possible. *Composite Completeness Indicator*, calculated analogously to the composite indicators in MGNREGA, with the Completion Rate (New) and Completion Rate (Upgrades) as its constituents.

2. **Cost Efficiency.** We focus on the expenditure per kilometer of completed road. We obtain both completed road length and total expenditure from official PMGSY data. We deflate total expenditure figures using the Consumer Price Index (Rural Labourers) state series released by the Labour Bureau of the Ministry of Labour and Employment, Government of India. Since we do not have information about how expenditure on any given work was distributed across time, we attribute the entire expenditure to the financial year in which the work was completed, and deflate it using that year's Index value. We derive three indicators of cost efficiency: *Cost Efficiency (New) Indicator,* defined as the average cost in lakh INR of each kilometer of completed new road length. *Cost Efficiency (Upgrades) Indicator*, defined as the average cost in lakh INR of each kilometer of completed upgrade works. *Composite Cost Efficiency Indicator*, with the two other cost efficiency indicators as constituents. There is an important difference between this composite indicator and all the preceding ones in

that its constituents have the opposite desirability ordering. With cost efficiency indicators, lower values are more desirable than higher values. Therefore, the indices derived from the constituents measure the relative distance from the minimum rather than the maximum (using the formula $\frac{Benchmark-Value}{Benchmark-min}$ benchmark set to the maximum value of the corresponding indicator), so that the resulting indicator is ordered in the traditional way, i.e. higher values are more desirable.

3. **Contractor Concentration.** We use the Herfindahl Hirschman Index (HHI)[12] value of less than 0.15 as 'unconcentrated'; between .15 and .25 as 'moderately concentrated'; and over .25 as highly concentrated. We derive a single **Contractor Concentration Indicator,** defined as the absolute distance of the average district level HHI from 0.2. We obtain the identities of the contractor for each work from official PMGSY data. Since works are awarded through an online tendering process, and there are very few works awarded in any given year, we calculate the HHI using contracts awarded over the entire period in the concerned geography. We initially calculate the HHI at the district level, since tenders are floated at this level, and for the state level analysis we average using the total road length of contracts awarded in a district as weights.

4. **Timeliness.** We obtain data on the stipulated and actual dates of completion in the official PMGSY data to derive three indicators related to timeliness. Delay Coverage Indicator, defined as the proportion of completed projects for which the actual date of completion was later than the stipulated date of completion. Delay Intensity Indicator, defined as the average delay per kilometer within delayed projects. Composite Delay Indicator, with the other two delay indicators as constituents. Like the Composite Cost Efficiency Indicator, the constituent indicators are ordered such that lower values are more desirable, so we measure the relative distance from the minimum using the maximum as the no action benchmark[13] in calculating the corresponding indices.

5. **Quality.** We use official PMGSY data on quality inspections by National and State Quality Monitors (NQMs and SQMs). The data indicate that quality inspections only began in 2010, so the time span for quality data is more recent. We calculate three indicators. **Quality Coverage Indicator**, defined as the percentage of inspectable road length that was inspected by either an NQM or SQM at least once. Quality monitors often inspect works under progress, so we considered all works which were either sanctioned or completed during our time period. For completed works we considered the completed road length, and for sanctioned but incomplete works we considered the stipulated road length. **Quality Intensity Indicator**, defined as the percentage of inspected length that was graded satisfactory. Here, multiple inspections of the same work count as separate, since it is possible for one inspection to fail quality standards and the next to pass them once adequate repair work has been carried out. **Composite Quality Indicator**, with the other two quality indicators as constituents, calculated in a way analogous to the Composite Completeness Indicator.

6. **Overall Performance.** We calculate the Composite Overall Indicator with five constituents relating to each of the five aspects outlined above. For completion rates, cost efficiency, timeliness and quality, we use the corresponding composite indicator. For contractor concentration, we use the Contractor Concentration Index.

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[12] An index of market concentration obtained by summing the squares of market shares of each player. It takes values between 0 (perfect competition) and 1 (monopoly), though it is sometimes multiplied by 10,000 for ease of exposition.
[13] This phrase comes from the HDI index - where the least desirable value of an indicator is called the 'no action benchmark', i.e. what the value would be if the state didn't take any action towards bettering road outcomes.

RESULTS (PMGSY)

Table 4 and Table 5 show the values of all the indicators described above at the state level, as well as ranks derived from them.

New road completion rates are extremely low, especially given that the program had been active for nineteen years as of 31 March 2019.

The highest completion rate was only 71% (West Bengal). Moreover, there is considerable variation - the median value is 43%, and the lowest value is only 13% (Karnataka). The situation is similar with regard to upgrade completion rates. Tamil Nadu has the highest completion rate of 63%, while Jharkhand has the lowest completion rate of 13%. Figure 6 below displays the states performance on completion.

Figure 6: Completeness Composite (PMGSY)
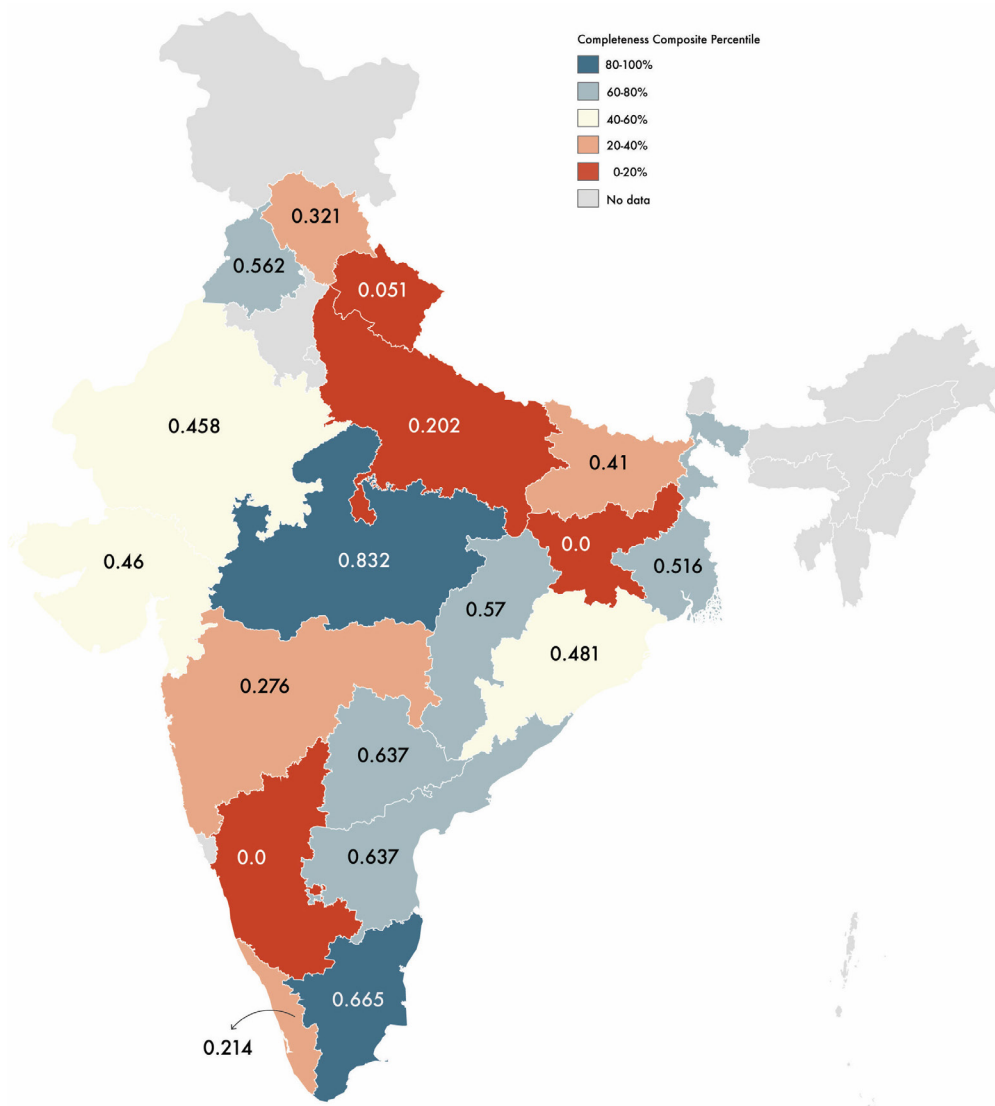
Cost efficiency also varies widely. Regarding new roads, top performer Karnataka (INR 9.94 lakh per km) builds at less than a third of the cost of worst performer Assam (30.55). Assam is an outlier, with no other State having a per km cost greater than INR 21.70 lakh. States which build new roads at a lower cost also tend to upgrade at a lower cost, and vice versa.

Raw HHI numbers (not presented) reveal that most states have extremely fragmented markets, with all but two states having HHI values of below 0.10. The indicator reveals that Gujarat and Haryana have HHI values closest to 0.20, while Himachal Pradesh, Punjab and Jharkhand have HHI values the farthest away (a distance of 0.18). In all, 11 of the 19 states have HHI values at a distance of over 0.15 from 0.20 (all lower). This confirms an observation made to us by a senior government official that it was hard to find capable contractors in rural areas.

The delay coverage indicator paints a worrying picture, with even best-performing Gujarat witnessing 49% of works delivered late. Rajasthan follows closely with 56% of projects delivered late. Four other states saw between 69% and 80% of projects delivered late - Andhra Pradesh, Jharkhand, Punjab and Tamil Nadu. Most states see over 80% of works delivered late, with Kerala (91%) and Odisha (91%) performing the worst. Haryana has the lowest average delay duration per km among delayed projects at 23 days, followed by Punjab (36), Rajasthan (52), Uttarakhand (63), Andhra Pradesh (66) and Karnataka (66). At the other extreme, Kerala (233), Assam (217) and Bihar (187) have extremely high average delays per km among delayed works. In all, 12 of the 19 states have average delays of over 100 days per km for delayed projects. Generally, states which see late delivery in more works also tend to have a higher average delay duration per km among those delayed projects.

While over 80% of inspectable road length was inspected in West Bengal, Uttarakhand, Jharkhand and Bihar; only 15% was inspected in Haryana, and between 24% and 29% was inspected in Andhra Pradesh, Karnataka and Rajasthan. Gujarat sees the highest percentage of inspected road length receiving a satisfactory rating (93%), followed closely by Kerala (92%), Tamil Nadu (89%) and Uttarakhand (88%); while Bihar saw the lowest (63%), followed by Assam (65%), Maharashtra (70%), Rajasthan (70%) and Odisha (70%). Uttarakhand's consistent performance over coverage and intensity in quality puts it in pole position overall with a composite indicator value of 0.89, followed closely by Kerala (0.88). Four other states have values of between 0.74 and 0.82 - Madhya Pradesh, West Bengal, Jharkhand and Gujarat. The worst overall performers are Haryana, Bihar, Assam, Andhra Pradesh and Rajasthan, with indicator values of below 0.25.

To summarize: the overall picture that emerges from this discussion is one where there are very few clear star performers, unlike with MGNREGA. Different states perform exceedingly well at some aspects of the program, and badly at others. No state consistently ranks in the top five across the five aspects, and only Gujarat manages to rank in the top ten across all four composite indicators and the concentration indicator. Gujarat is also the only State to top the overall rankings for more than one of the five aspects, achieving pole position in the contractor concentration indicator and the composite delay indicator. Consequently, Gujarat is the best performer on the overall composite indicator, with a value of 0.83. Punjab, with only one bottom-half ranking, follows at a fair distance with a value of 0.57. Rounding off the top five are Madhya Pradesh (0.48), Tamil Nadu (0.47) and Chhattisgarh (0.47). Only two other states have values of over 0.40. At the other end are Bihar, Jharkhand, Karnataka, Kerala and Odisha, with values of 0.00 by virtue of being at the bottom of at least one of the constituent indicators. Note that Assam and Haryana do not have values for the overall composite indicator since they are missing values for the composite completeness and efficiency indicators.

State trends of Composite Indicators of PMGSY
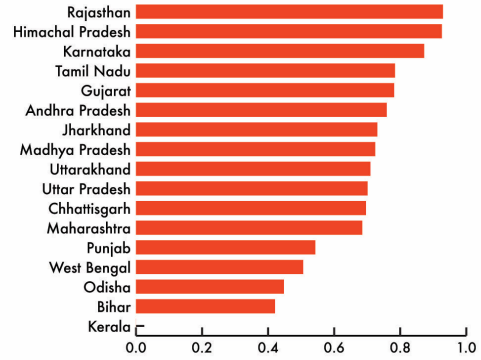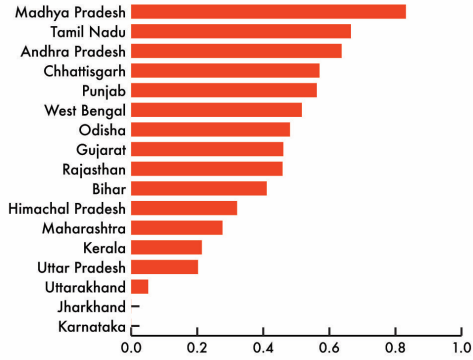
Completeness

Efficiency
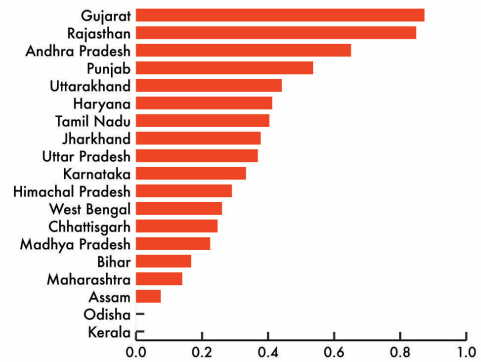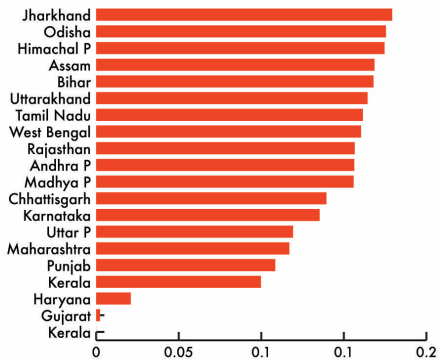
Concentration

Timeliness
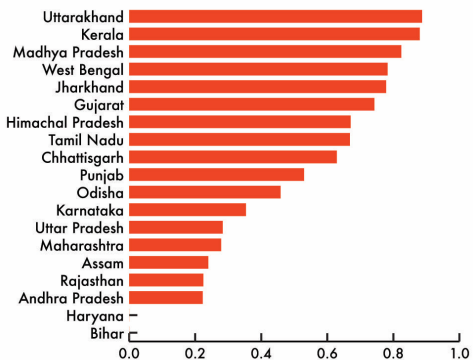
Quality

Figure 7 above summarizes this overall picture and shows that there is no clear pattern with respect to which states are doing well overall. Table 6 shows the pairwise correlation coefficients between the overall composite indicator's five constituent indicators, and confirms that a good performance on one indicator is not associated with a good performance on another. There is only one moderate coefficient of 0.60 between the cost efficiency and timeliness indicators, while the rest are 0.36 or below in absolute value.

Table 7 below shows that there is convergence over time for most indicators of program success. This is especially noticeable for Completeness, Cost efficiency, Delay coverage and Quality intensity, which is encouraging. This is a significant difference from MGNREGA outcomes.

Table 7: PMGSY Dynamic Analysis: Beta Coefficients from Regressing Compound Annual Growth Rates on Earliest Values

Indicator	Beta Coefficient
Completeness (New)	-126.6094^{***}
	(20.78)
Completeness (Upgrade)	-102.207^{**}
	(23.68)
Completeness Composite	-62.09387^{*}
	(19.30)
Cost Efficiency (New)	-0.0036497^{***}
	(0.00104)
Cost Efficiency (Upgrade)	-0.0065085^{***}
	(0.00112)
Cost Efficiency (Composite)	-0.0485691^{**}
	(0.0212)
Concentration	
Delay Coverage	-0.2659174^{***}
	(0.0334)
Delay Intensity	-0.0011204^{***}
	(0.000354)
Delay Composite	0.0558659
	(0.376)
Quality Coverage	-1.026201^{**}
	(0.458)
Quality Intensity	-0.1650405^{***}
	(0.0279)
Quality Composite	-0.3528196^{**}
	(0.157)
Overall Composite	0.0633284
	(0.155)

Standard errors in parentheses
$^{*}\ p < 0.10$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$

DETERMINANTS OF PROGRAM SUCCSSS

While several studies investigated the effect of social programs like MGNREGA's and PMGSY's success on various social indicators, very few have investigated the determinants of program success. (Bonner, 2012) found that only literacy was significantly correlated with MGNREGA success. (Jha, 2011) used household survey data to show that in three states (Rajasthan, Andhra Pradesh and Maharashtra) females had a lower chance of being selected for MGNREGA work, and being educated to secondary level or above increased the duration of employment once selected. We are not aware of any studies investigating the determinants of PMGSY success.

1. *State Capacity:* Given how critical local government is to the implementation of both MGNREGA and PMGSY, we attempt to establish a link between state capacity and program performance. State capacity is broadly defined as the "degree of control that state agents exercise over persons, activities, and resources within their government's territorial jurisdiction (McAdam, 2001). (Hanson, 2013), in keeping with the consensus view in the Political Science literature, consider state capacity to have three main dimensions – extractive (raising revenue), coercive (maintaining order and enforcing policies) and administrative (producing and delivering public goods and services). Clearly, administrative state capacity is the relevant dimension for our purposes.

Quantitatively measuring administrative state capacity is extremely hard, so it is common practice to use indicators that measure outcomes of public goods and service delivery as proxies (Hanson, 2013). We use indicators of successful public goods and service delivery from 2001 and see if they are correlated with MGNREGA and PMGSY performance. We chose 2001 for two reasons. First, 2001 was a census year that has rich data availability at granular geographic levels. Second, it is conceivable that the successful delivery of MGNREGA and PMGSY make it easier to achieve good outcomes in other programs, giving rise to spurious correlation. We thus choose indicators of state capacity from a time when MGNREGA did not exist and PMGSY was in its infancy in order to minimize the scope for spurious correlation. Therefore, our indicators are derived from the 2001 census data, and include the sex ratio (females per thousand males), the total literacy rate, the female literacy rate, the difference between the female and male literacy rates, the percentage of households living in permanent dwellings, the percentage of households with access to tapped water, the percentage of households with access to electricity, percentage of households with a bathroom inside the dwelling, and the percentage of households with access to banking facilities.

We conducted a simple correlation analysis between values of the MGNREGA and PMGSY success indicators, and those of the 2001 administrative capacity indicators. We undertook this analysis at the district level to allow for enough observations to conduct statistical tests, and to take advantage of variations in administrative state capacity within states. Since Indian administrative boundaries have changed since 2001, with several new districts and some new states being added, we calculated all indicators with reference to 2001 boundaries. Where new districts have been carved entirely out of districts, MGNREGA and PMGSY observations in such districts were allocated to the old undivided district. Where new districts have been carved out of several old districts, we allocated observations based on sub-district regions like blocks where possible. However, where this was not possible, we created 'district clusters' pooling together the 2001 districts which were carved up so as not to lose data.

Tables 8, 9 and 10 show pairwise correlation coefficients between the MGNREGA and PMGSY performance indicators respectively on the one hand, and 2001 state capacity indicators on the other.

All the general MGNREGA indicators have statistically significant (at the 5% level) positive correlations with one or more of the 2001 state capacity indicators. For the intensity and overall composite indicators, the vast majority of correlations are significant at the 1% level. The story is similar with regard to the SC-ST indicators. While each of the coverage and intensity indicators are positively and significantly correlated with at least four 2001 state capacity indicators, the number of significant correlations and their level of significance are both higher for the intensity indicator. The composite SC-ST indicator is also significantly positively correlated with all but one of the 2001 state capacity indicators. Thus, districts with higher state capacity in 2001 performed better on the MGNREGA indicators calculated using data between 2011-12 and 2018-19, with the relationship being much stronger for intensity than coverage. Most PMGSY indicators have significant (at the 5% level) correlations suggesting that districts with better PMGSY performance also had better 2001 state capacity indicators.

However, there are two exceptions: the cost efficiency (upgrade) and quality coverage indicators. For the former (where lower values are more desirable) costs are positively correlated with better 2001 state capacity in five instances, and negatively in two instances. For the latter (where higher values are more desirable) higher inspection coverage is attained in districts with worse 2001 state capacity according to six indicators, and better according to only one. Thus, while 2001 state capacity is largely correlated with better PMGSY performance, some aspects of the program bucked the trend. A valuable avenue for future research would be to identify the mechanisms through which the state capacity disadvantage was overcome in these aspects, and whether those lessons can be applied to other contexts and, specifically, to future public goods and service programs.

2. *Accountability:* Unfortunately, we did not have data at the district level for perceptions of corruption. The correlations at the state level are only suggestive because we have such few data points.

Tables 11, 12 and 13 show pairwise correlation coefficients between the MGNREGA and PMGSY performance indicators with corruption indicators respectively. The correlation analysis is conducted at state level. In Table 11, which depicts MGNREGA performance, the relationship between composite corruption score and all performance indicators are negative and statistically significant except one. The values are highly significant for financial coverage, composite intensity and composite overall. Most performance indicators have higher values in states where households experienced less corruption. There is an inverse relationship between bribe paid and all performance indicators, with composite overall indicators being statistically significant. There is a positive correlation between RTI awareness in 2007 and performance indicators.

Tables 12 and 13 show the correlation between PMGSY program success indicators and corruption. As expected, lower value of delay coverage and intensity indicators are associated with higher anti-corruption effort index. Since higher composite delay is desirable, we have a positive correlation between anti-corruption index and composite delay indicators. All these values are significant at 5% level.

There is a positive and statistically significant relationship between completeness (upgrade) and anti-corruption index whereas the relationship is negative and statistically significant for contractor concentration and quality coverage. The overall composite measure has a positive and statistically significant correlation with the anti-corruption index. The relationship between the quality indicators and some of the other corruption indicators such as composite corruption score, percentage of households who have experienced corruption and mean direct experience of bribing is also negative and statistically significant. To summarize, many of the correlations between PMGSY program performance indicators and corruption measures are negative with the strongest relationship being there for quality indicators and delay indicators.

3. *Level of development:* Using per capita income (NSDP per capita) in 2000 for PMGSY and 2011 for MGNREGA, we find a generally positive correlation between states performance and level of development. This is not unexpected as state capacity is usually higher for more developed states. Figures 8 and 9 below show the relationship for the two programs.

Figure 8: State Performance of Composite Indictaors and PCI (MGNREGA)
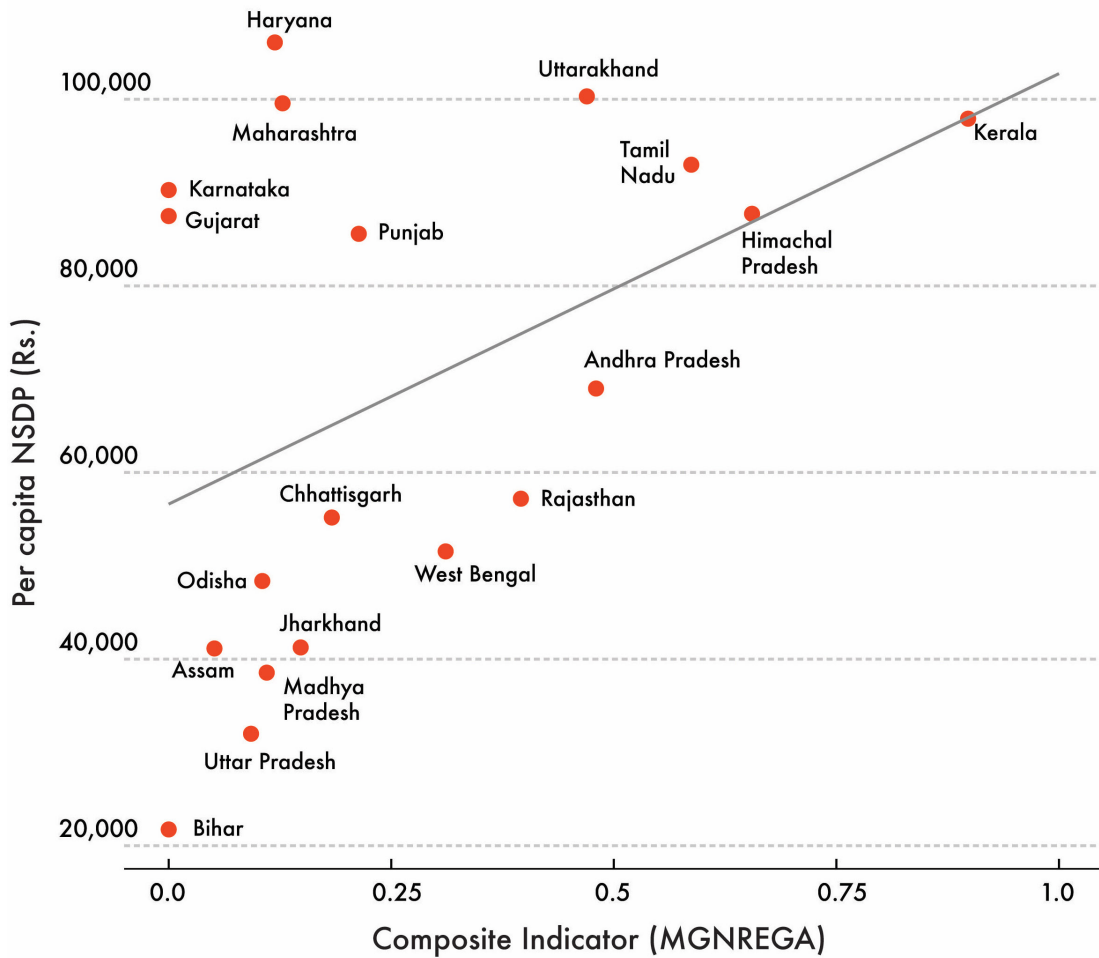
Figure 9: State Performance of Composite Indictaors and PCI (PMGSY)
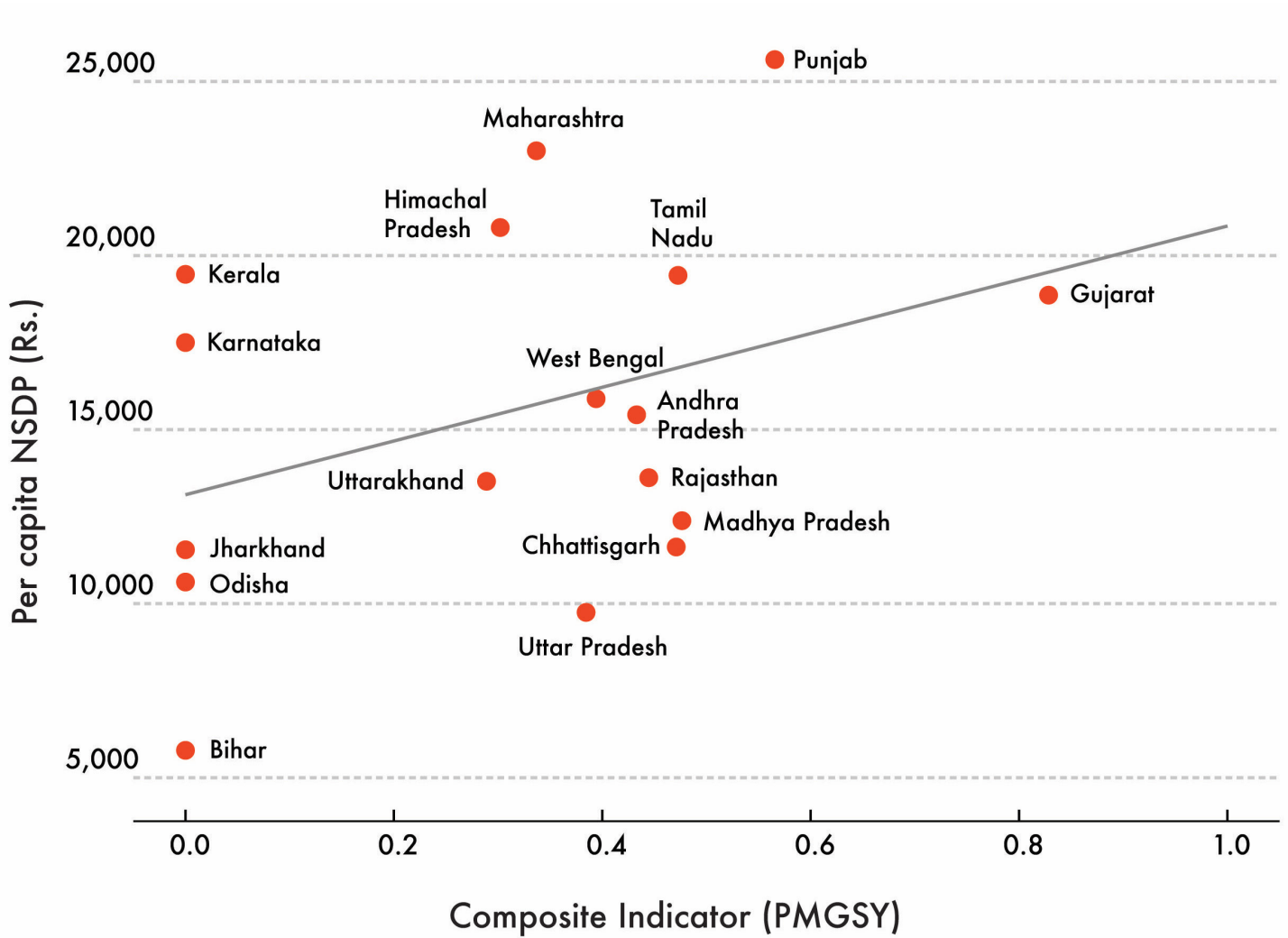
4. **HDI:** Using the HDI index in 2000 for PMGSY and 2011 for MGNREGA, Figure 10 shows a positive correlation for MGNREGA and HDI. From Figure 11, we see that although there exists a positive relationship between HDI and PMGSY, the relationship is much weaker compared to the relationship for MNREGA.

Figure 10: State Performance on Composite Indicators and HDI (MGNREGA)
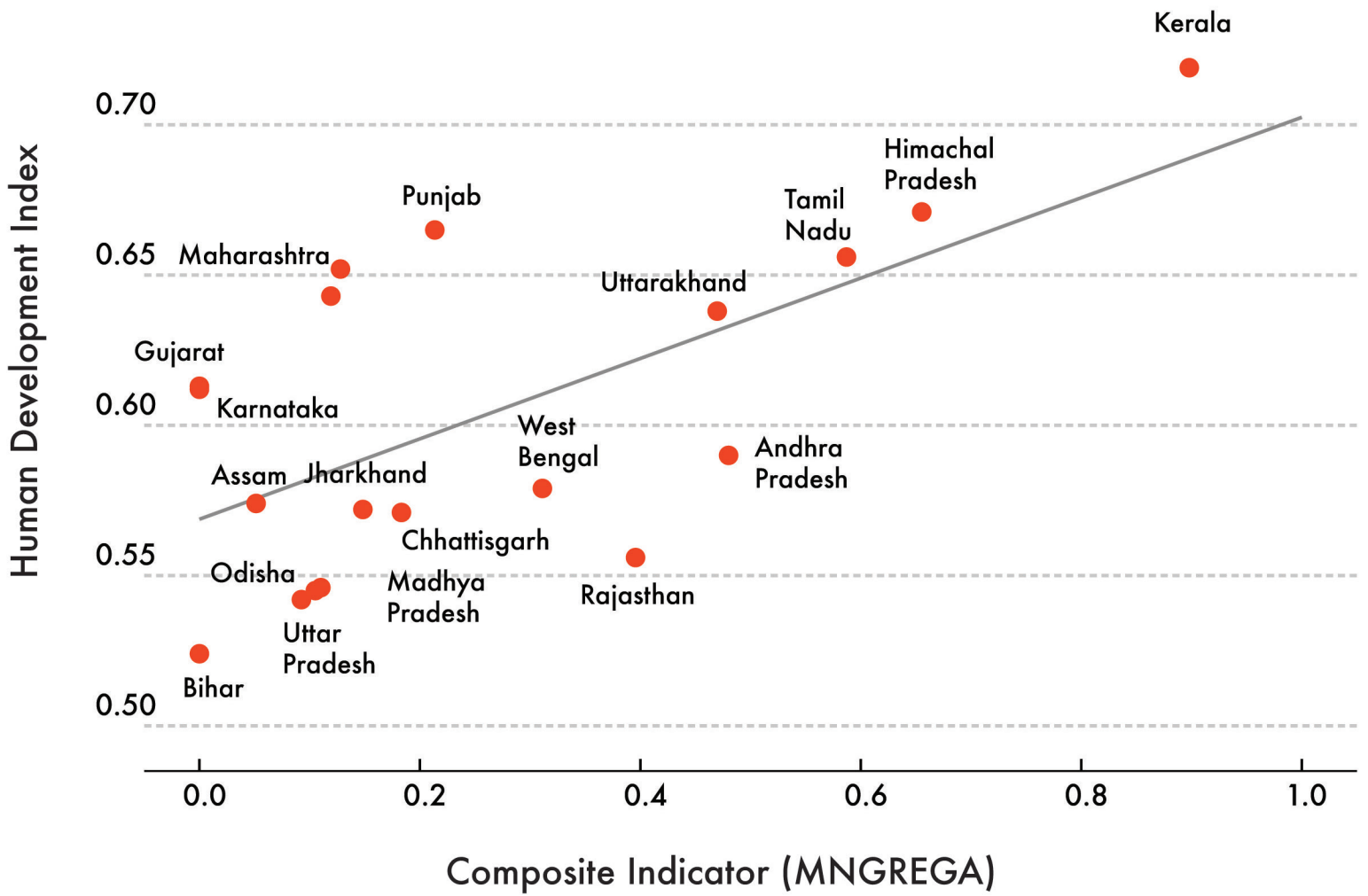
Figure 11: State Performance of Composite Indicators and HDI (PMGSY)
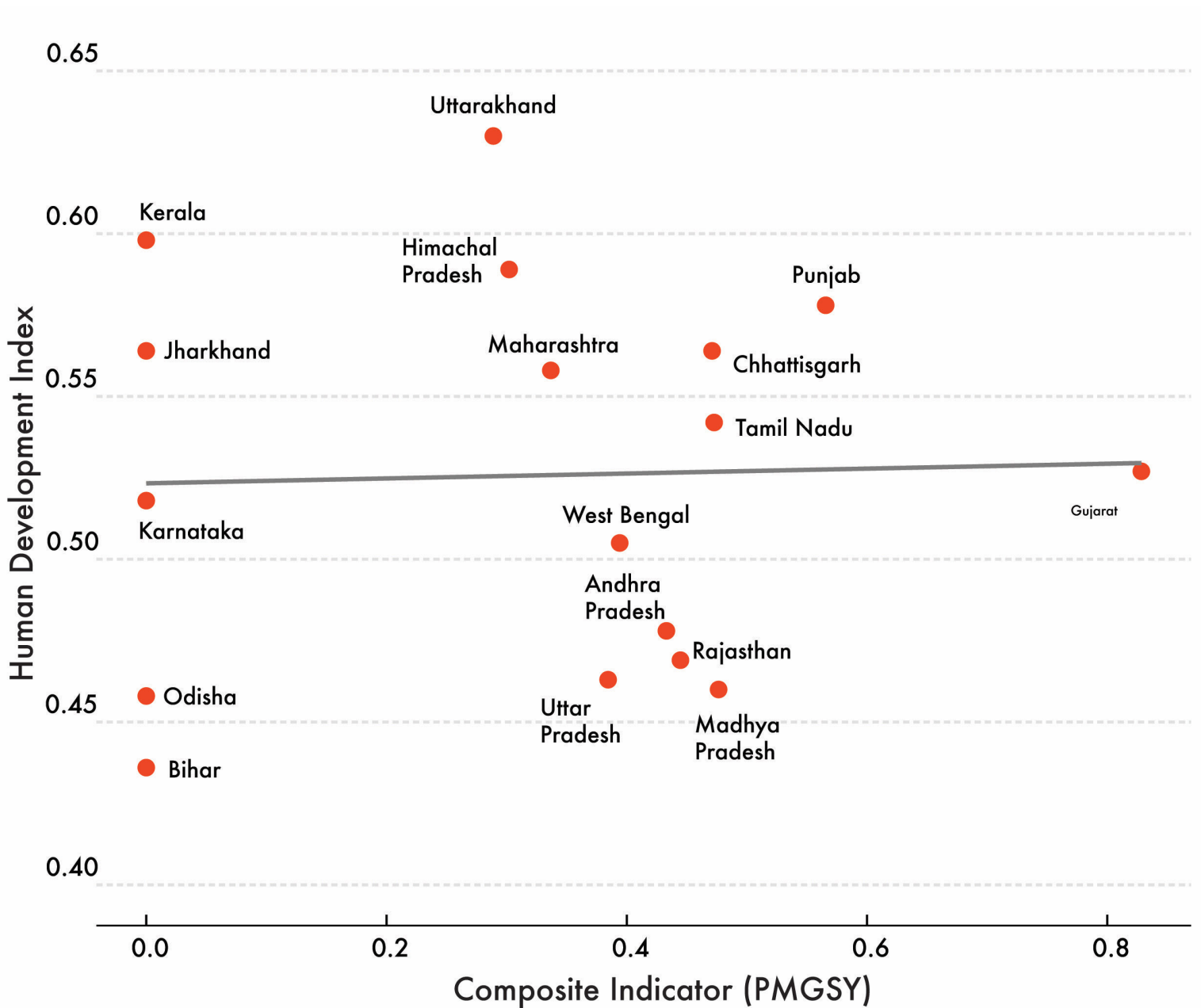
CONCLUSION AND POLICY RECOMMENDATIONS

In this report we contribute to the existing literature on performance of two big Indian national government programs, MGNREGA (2011- 2018) and PMGSY (2000-2018) by providing some new performance indicators which can be used to track progress. We used these indicators to show how different states performed in these two programs. While in the case of MGNREGA, it is clear that the same set of states perform well across all indicators (Tamil Nadu, Andhra Pradesh, Rajasthan and Kerala), this is not the case with PMGSY where we find little correlation between the five different indicators. We suggest that the latter needs further research.

Finally, we looked at whether states are converging over time, which may be expected for MGNREGA since it was always a demand driven program ,and poorer states therefore getting more resources. Yet, we find that there is convergence only in intensity but not in coverage. It is puzzling that in some of the worst performing states some districts are getting highly concentrated benefits. Surprisingly, there is convergence on most indicators in PMGSY.

There is a positive correlation between various measures of state capacity and performance on the two programs, and negative correlation between measures of corruption and performance indicators. All the governance indicators are only available at the state level so these results are only suggestive. If CAG data on corruption was available at a granular level, we could have improved on these regressions. We also showed that per capita NSDP and HDI are both positively correlated with program success indicators. Overall, the divide between well performing states and others comes down to the well-known differences between developed states relative to others. However, Rajasthan and AP do significantly well on MGNREGA indicators despite not being very developed- it is no coincidence that it is in these states that social accountability mechanisms in MGNREGA started and are the most robust, pointing to the importance of monitoring mechanisms.[14]

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[14] While studies on social audits and NREGA performance are limited, Afridi and Iversen, 2014 show that social audits do not have a significant effect on corruption in NREGA.

Figure 4: MGNREGA: Movement of Composite Coverage Indicator (General) Over Time
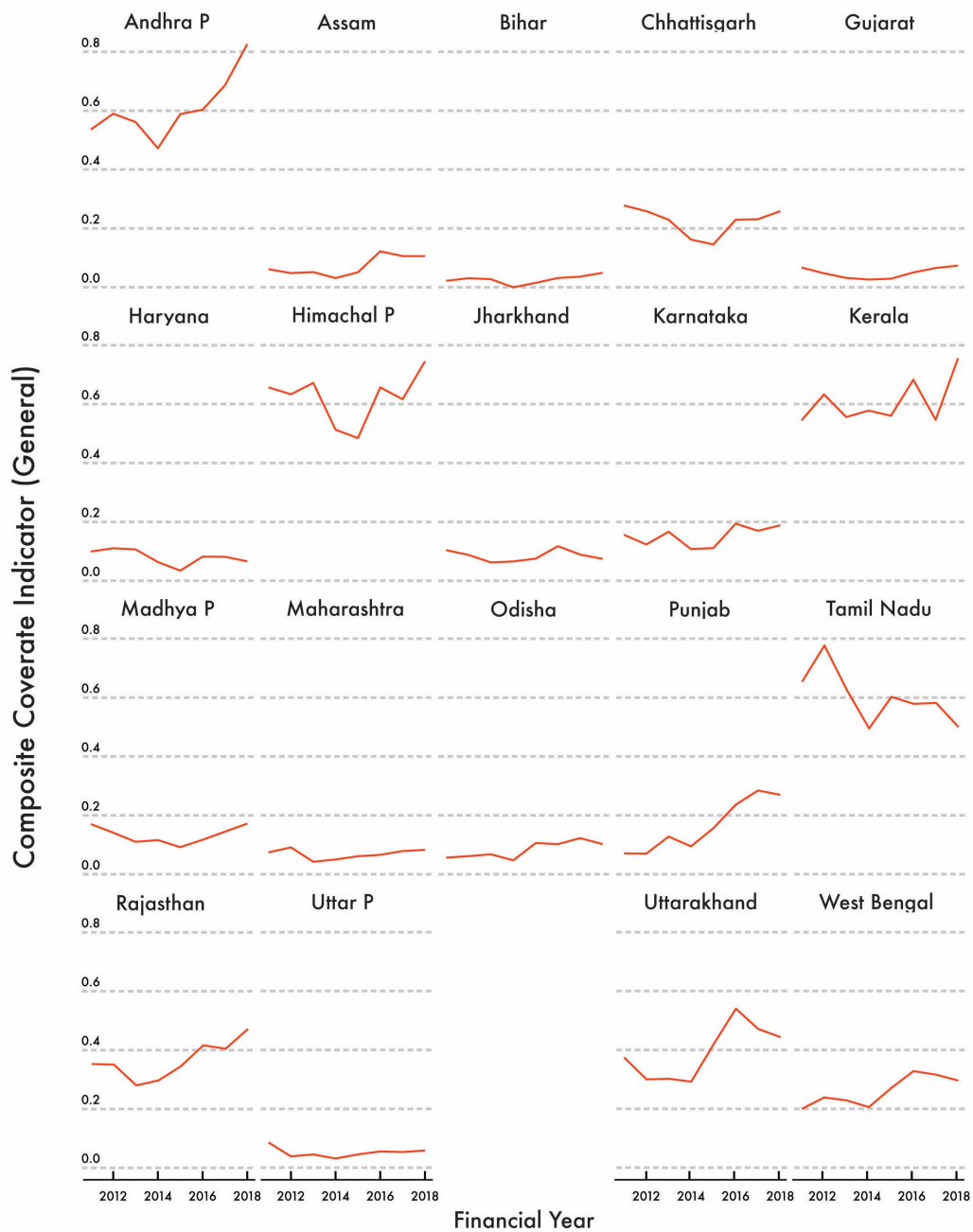
Figure 5: MGNREGA: Movement of Composite Intensity Indicator (General) Over Time

Composite Intensity Indicator (General)

Financial Year

INTER-STATE COMPARISON OF PERFORMANCE IN MGNREGA (2011-2018) AND PMGSY (2000-2018)

Table 1: MGNREGA Static Analysis: Inter-State Comparison (General)

State	Dem Coverage Value	Rank	Fin Coverage Value	Rank	Comp Coverage Value	Rank	Dem Intensity Value	Rank	Fin Intensity Value	Rank	Comp Intensity Value	Rank	Comp Overall Value	Rank
Andhra P	4.17	1	13 543	4	0.81	2	32.42	7	3252	13	0.29	8	0.48	4
Assam	0.70	13	1851	16	0.06	15	20.39	18	2656	18	0.04	17	0.05	16
Bihar	0.28	19	1173	19	0.00	19	32.87	6	4252	3	0.44	3	0.00	17
Chhattisgarh	1.74	8	4981	8	0.28	8	23.95	14	2867	15	0.12	15	0.18	9
Gujarat	0.54	17	1336	18	0.02	18	21.94	17	2467	19	0.00	18	0.00	17
Haryana	0.61	15	2416	12	0.07	14	22.23	16	3987	5	0.19	13	0.12	12
Himachal P	3.66	3	16 020	2	0.83	1	37.25	3	4380	2	0.52	2	0.66	2
Jharkhand	0.68	14	2356	13	0.08	12	28.62	9	3487	10	0.27	10	0.15	10
Karnataka	1.24	9	3482	10	0.17	10	19.18	19	2817	16	0.00	18	0.00	17
Kerala	2.80	4	20 065	1	0.81	3	46.52	1	7155	1	1.00	1	0.90	1
Madhya P	1.12	11	3043	11	0.15	11	22.71	15	2715	17	0.08	16	0.11	13
Maharashtra	0.55	16	2066	15	0.06	16	27.17	11	3762	6	0.28	9	0.13	11
Odisha	0.72	12	2164	14	0.08	13	24.14	13	2988	14	0.14	14	0.11	14
Punjab	1.14	10	4272	9	0.19	9	24.89	12	3745	7	0.24	12	0.21	8
Rajasthan	2.54	5	8299	6	0.47	6	37.08	4	3265	12	0.33	6	0.40	6
Tamil Nadu	3.92	2	14 039	3	0.80	4	40.60	2	3579	9	0.43	5	0.59	3
Uttar P	0.47	18	1601	17	0.03	17	28.11	10	3379	11	0.25	11	0.09	15
Uttarakhand	2.44	6	10 008	5	0.51	5	33.82	5	4106	4	0.43	4	0.47	5
West Bengal	1.80	7	6458	7	0.33	7	28.89	8	3598	8	0.29	7	0.31	7

Table 2: MGNREGA Static Analysis: Inter-State Comparison (SC/ST)

State	Dem Coverage Value	Rank	Dem Intensity Value	Rank	Comp Overall Value	Rank
Andhra P	3.09	1	54.68	2	0.97	1
Assam	1.02	9	26.97	19	0.00	18
Bihar	0.31	18	40.76	12	0.07	17
Chhattisgarh	0.94	10	48.98	6	0.42	8
Gujarat	0.53	15	38.18	15	0.18	16
Haryana	0.74	11	33.44	17	0.19	15
Himachal P	2.95	3	48.39	7	0.83	4
Jharkhand	0.64	14	40.30	14	0.24	10
Karnataka	0.50	17	46.46	8	0.23	11
Kerala	2.25	4	56.28	1	0.84	3
Madhya P	0.70	12	43.30	10	0.29	9
Maharashtra	0.28	19	50.80	5	0.00	18
Odisha	0.52	16	40.45	13	0.20	13
Punjab	1.82	6	29.61	18	0.22	12
Rajasthan	1.80	7	53.99	4	0.71	5
Tamil Nadu	3.01	2	54.21	3	0.95	2
Uttar P	0.69	13	34.44	16	0.19	14
Uttarakhand	1.96	5	42.98	11	0.57	6
West Bengal	1.67	8	44.09	9	0.54	7

Table 4: PMGSY Static Analysis: Inter-State Comparison (Part 1)

State	Compl New Value	Compl New Rank	Compl Upgrade Value	Compl Upgrade Rank	Comp Compl Value	Comp Compl Rank	Efficiency New Value	Efficiency New Rank	Efficiency Upgrade Value	Efficiency Upgrade Rank	Comp Efficiency Value	Comp Efficiency Rank	Concentration Value	Concentration Rank
Andhra P	0.37	14	0.62	2	0.64	3	13.79	6	14.69	9	0.76	6	0.16	10
Assam	0.49	8					30.55	18					0.17	16
Bihar	0.68	2	0.22	16	0.41	10	21.70	17	19.17	15	0.42	16	0.17	15
Chhattisgarh	0.68	3	0.30	10	0.57	4	16.78	12	14.43	7	0.70	11	0.14	8
Gujarat	0.46	9	0.31	9	0.46	8	15.66	10	12.62	3	0.78	5	0.00	1
Haryana			0.52	4					19.30	16			0.02	2
Himachal P	0.40	12	0.24	15	0.32	11	12.87	3	10.28	1	0.93	2	0.18	17
Jharkhand	0.53	7	0.13	18	0.00	16	14.72	8	14.90	11	0.73	7	0.18	19
Karnataka	0.13	18	0.39	6	0.00	16	9.94	1	13.90	4	0.87	3	0.14	7
Kerala	0.21	16	0.28	11	0.21	13	18.56	14	25.41	18	0.00	17	0.10	3
Madhya P	0.64	4	0.52	3	0.83	1	15.63	9	14.45	8	0.72	8	0.16	9
Maharashtra	0.23	15	0.34	8	0.28	12	17.72	13	14.01	5	0.69	12	0.12	5
Odisha	0.58	5	0.28	12	0.48	7	21.20	16	18.72	14	0.45	15	0.18	18
Punjab	0.43	10	0.43	5	0.56	5	13.34	5	20.07	17	0.54	13	0.11	4
Rajasthan	0.57	6	0.27	13	0.46	9	10.75	2	11.81	2	0.93	1	0.16	11
Tamil Nadu	0.39	13	0.63	1	0.67	2	13.31	4	14.28	6	0.78	4	0.16	13
Uttar P	0.18	17	0.36	7	0.20	14	14.59	7	15.81	12	0.70	10	0.12	6
Uttarakhand	0.42	11	0.13	17	0.05	15	15.89	11	14.70	10	0.71	9	0.16	14
West Bengal	0.71	1	0.26	14	0.52	6	20.21	15	17.68	13	0.51	14	0.16	12

Table 5: PMGSY Static Analysis: Inter-State Comparison (Part 2)

State	Delay Coverage Value	Delay Coverage Rank	Delay Intensity Value	Delay Intensity Rank	Comp Delay Value	Comp Delay Rank	Quality Coverage Value	Quality Coverage Rank	Quality Intensity Value	Quality Intensity Rank	Comp Quality Value	Comp Quality Rank	Comp Overall Value	Comp Overall Rank
Andhra P	0.69	3	66	5	0.65	3	0.24	18	0.74	13	0.22	17	0.43	7
Assam	0.88	16	217	18	0.07	17	0.64	9	0.65	18	0.24	15		
Bihar	0.85	12	187	17	0.17	15	0.80	4	0.63	19	0.00	18	0.00	13
Chhattisgarh	0.86	14	109	10	0.25	13	0.57	10	0.83	8	0.63	9	0.47	5
Gujarat	0.49	1	73	7	0.87	1	0.55	11	0.93	1	0.74	6	0.83	1
Haryana	0.84	9	23	1	0.41	6	0.15	19	0.86	6	0.00	18		
Himachal P	0.84	10	128	14	0.29	11	0.71	8	0.80	12	0.67	7	0.30	11
Jharkhand	0.78	4	137	15	0.38	8	0.82	3	0.82	10	0.78	5	0.00	13
Karnataka	0.85	11	66	6	0.33	10	0.27	17	0.85	7	0.35	12	0.00	13
Kerala	0.91	18	233	19	0.00	18	0.72	7	0.92	2	0.88	2	0.00	13
Madhya P	0.87	15	100	8	0.23	14	0.77	5	0.87	5	0.82	3	0.48	3
Maharashtra	0.89	17	109	11	0.14	16	0.38	14	0.70	17	0.28	14	0.34	10
Odisha	0.91	19	143	16	0.00	18	0.74	6	0.70	15	0.46	11	0.00	13
Punjab	0.78	5	36	2	0.54	4	0.45	13	0.83	9	0.53	10	0.57	2
Rajasthan	0.56	2	52	3	0.85	2	0.29	16	0.70	16	0.23	16	0.45	6
Tamil Nadu	0.79	6	110	12	0.40	7	0.52	12	0.89	3	0.67	8	0.47	4
Uttar P	0.80	7	120	13	0.37	9	0.36	15	0.71	14	0.28	13	0.38	9
Uttarakhand	0.81	8	63	4	0.44	5	0.83	2	0.88	4	0.89	1	0.29	12
West Bengal	0.86	13	100	9	0.26	12	0.87	1	0.81	11	0.78	4	0.39	8

Table 6: PMGSY Static Analysis: Correlation Between the Five Constituents of the Overall Composite Indicator

	Completeness	Cost Efficiency	Concentration	Timeliness	Quality
Completeness	1.00				
Cost Efficiency	0.02	1.00			
Concentration	−0.01	0.11	1.00		
Timeliness	0.13	0.60	−0.36	1.00	
Quality	−0.03	−0.16	0.11	−0.05	1.00

Table 8: MGNREGA: Pairwise Correlation Coefficients between Program Success Indicators and 2001 State Capacity Indicators

2001 State Capacity Indicator	Coverage			Intensity			Overall Comp	SC/ST		
	Dem	Fin	Comp	Dem	Fin	Comp		Cov	Int	Comp
Sex ratio	0.08*	0.11**	0.09**	0.22***	0.14***	0.19***	0.27***	0.07	0.31***	0.17***
Lit rate (total)	0.07	0.11**	0.08*	0.18***	0.30***	0.24***	0.31***	0.09*	0.17***	0.18***
Lit rate (F)	0.07	0.11**	0.09*	0.18***	0.34***	0.26***	0.32***	0.11**	0.15***	0.19***
Lit rate gap (F-M)	0.07	0.10**	0.08*	0.13***	0.35***	0.25***	0.23***	0.14***	0.00	0.17***
% permanent dwel	0.07	0.09**	0.08*	0.31***	0.33***	0.33***	0.24***	0.03	0.07	0.13***
% tapped water	0.10**	0.12**	0.11**	0.17***	0.07	0.12**	0.28***	0.15***	0.24***	0.24***
% electrified	0.08*	0.10**	0.09**	0.02	0.06	0.02	0.26***	0.10**	0.26***	0.22***
% bath inside	0.05	0.07	0.06	0.04	0.27***	0.14***	0.16***	0.04	0.07	0.11**
% bank access	0.00	0.02	0.01	0.12**	0.34***	0.24***	0.09*	−0.01	−0.06	0.00

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: PMGSY: Pairwise Correlation Coefficients between Program Success Indicators and 2001 State Capacity Indicators (Part 1)

2001 State Capacity Indicator	Completion Rate			Cost Efficiency			Concentr
	New	Upgr	Comp	New	Upgr	Comp	
Sex ratio	0.06	0.04	0.13**	0.08	0.12**	−0.18***	0.18***
Lit rate (total)	0.08	0.10*	0.16***	−0.07	0.21***	−0.13**	−0.17***
Lit rate (F)	0.08	0.10*	0.16***	0.00	0.26***	−0.19***	−0.16***
Lit rate gap (F-M)	0.04	0.06	0.09	0.30***	0.41***	−0.35***	−0.09*
% permanent dwel	−0.02	0.10*	−0.01	−0.40***	−0.05	0.26***	−0.24***
% tapped water	0.04	0.32***	0.18***	−0.30***	−0.32***	0.25***	−0.11**
% electrified	0.08*	0.34***	0.29***	−0.36***	−0.17***	0.21***	−0.26***
% bath inside	0.11**	0.11**	0.10*	−0.34***	0.05	0.10*	−0.39***
% bank access	−0.01	0.01	−0.11*	−0.31***	0.13**	0.02	−0.25***

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: PMGSY: Pairwise Correlation Coefficients between Program Success Indicators and 2001 State Capacity Indicators (Part 2)

2001 State Capacity Indicator	Timeliness			Quality			Overall Comp
	Cov	Int	Comp	Cov	Int	Comp	
Sex ratio	0.07	0.10**	−0.09*	0.15***	0.22***	0.23***	−0.02
Lit rate (total)	0.03	0.02	−0.05	−0.11**	0.31***	0.08*	0.01
Lit rate (F)	0.05	0.07	−0.07	−0.07	0.31***	0.10**	0.00
Lit rate gap (F-M)	0.10**	0.23***	−0.14***	0.06	0.20***	0.14***	−0.03
% permanent dwel	−0.17***	−0.21***	0.19***	−0.25***	0.06	−0.18***	0.08
% tapped water	−0.18***	−0.29***	0.21***	−0.30***	0.25***	−0.15***	0.13**
% electrified	−0.14***	−0.35***	0.18***	−0.28***	0.41***	−0.06	0.28***
% bath inside	−0.10**	−0.21***	0.11**	−0.44***	0.24***	−0.28***	0.10*
% bank access	−0.04	−0.16***	0.06	−0.25***	0.10**	−0.15***	−0.06

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: MGNREGA: Pairwise Correlation Coefficients between Program Success Indicators and Corruption Indicators

Corruption Indicators	Coverage			Intensity			Overall Comp	SC/ST		
	Dem	Fin	Comp	Dem	Fin	Comp		Cov	Int	Comp
Anti-Corruption Effort Index (2001-2005)	0.04	−0.05	−0.01	−0.08	−0.13	−0.14	−0.12	0.04	0.00	0.01
Composite Corruption Score (2005)	−0.48**	−0.67***	−0.59**	−0.44**	−0.54**	−0.53**	−0.70***	−0.52**	−0.35	−0.50**
Mean Direct Experience of Bribing (%)(2005)	−0.22	−0.40	−0.31	−0.18	−0.37	−0.32	−0.46*	−0.28	−0.09	−0.25
Heard about RTI (%)(2007)	0.30	0.29	0.29	0.05	0.03	0.03	0.20	0.20	0.33	0.16
Households Experienced Corruption (%)(2005)	0.02	−0.19	−0.08	−0.02	−0.31	−0.19	−0.26	−0.04	−0.03	−0.01

$* \; p < 0.10, \; ** \; p < 0.05, \; *** \; p < 0.01$

Table 12: PMGSY: Pairwise Correlation Coefficients between Program Success Indicators and Corruption Indicators (Part 1)

Corruption Indicators	Completion Rate			Cost Efficiency			Concentr
	New	Upgr	Comp	New	Upgr	Comp	
Anti-Corruption Effort Index (1996-2000)	−0.06	0.48*	0.32	−0.35	0.02	0.12	−0.58**
Composite Corruption Score (2005)	0.36	0.09	0.10	0.12	−0.14	0.27	0.23
Mean Direct Experience of Bribing (%)(2005)	0.11	0.17	−0.01	0.02	−0.11	0.23	0.29
Heard about RTI (%)(2007)	−0.44*	0.31	−0.11	0.10	−0.13	0.08	0.16
Households Experienced Corruption (%)(2005)	0.39	0.08	0.24	−0.06	−0.18	0.25	0.46*

$* \; p < 0.10, \; ** \; p < 0.05, \; *** \; p < 0.01$

Table 13: PMGSY: Pairwise Correlation Coefficients between Program Success Indicators and Corruption Indicators (Part 2)

Corruption Indicators	Timeliness			Quality			Overall Comp
	Cov	Int	Comp	Cov	Int	Comp	
Anti-Corruption Effort Index (1996-2000)	−0.50**	−0.57**	0.59**	−0.53**	0.24	−0.26	0.46*
Composite Corruption Score (2005)	0.00	−0.14	0.05	−0.05	−0.42*	−0.50**	−0.13
Mean Direct Experience of Bribing (%)(2005)	0.01	−0.11	0.03	−0.19	−0.45*	−0.59***	−0.28
Heard about RTI (%)(2007)	0.02	0.21	−0.07	−0.24	−0.07	−0.06	−0.12
Households Experienced Corruption (%)(2005)	−0.01	−0.07	0.05	0.03	−0.44*	−0.45*	−0.23

$* \; p < 0.10, \; ** \; p < 0.05, \; *** \; p < 0.01$

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