Harnessing data science for social development

A data-driven approach to trigger large-scale socio-economic development

Experiences from supporting a nation-wide competitive benchmarking exercise in 85 Districts with low Human Development Index (HDI)
About Tata Trusts

Since inception in 1892, Tata Trusts, India’s oldest philanthropic organization, has played a pioneering role in bringing about an enduring difference in the lives of the communities it serves. Guided by the principles and the vision of proactive philanthropy of the Founder, Jamsetji Tata, the Trusts’ purpose is to catalyse development in the areas of health, nutrition, education, water, sanitation and hygiene, livelihood, digital transformation, migration and urban habitat, social justice and inclusion, environment and energy, skill development, sports, and arts and culture. The Trusts’ programmes, achieved through direct implementation, partnerships and grant making, are marked by innovations, relevant to the country. For more information, please visit https://www.tatatrusts.org/

Data Driven Governance at the Trusts

The Data Driven Governance (DDG) Initiative of the Tata Trusts works with rural and urban decision-making systems to enable inculcation of data as a way of life in the planning and delivery of government schemes – thereby creating significant impact for underserved and marginalised communities. This has been demonstrated through deployment of inclusive data and technology processes at district and city levels, through large-scale partnerships with governments, central planning entities, foundations and philanthropies such as the National Institution for Transforming India (NITI) Aayog, Ministry of Housing and Urban Affairs and Tata Steel Rural Development Society.

This document captures the learnings and experiences of implementation of a nation-wide competitive benchmarking exercise in low Human Development Index (HDI) districts of India.
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Disclaimer

This document has been developed based on the functional, technical and field experiences of Tata Trusts during the DELTA implementations in different geographies, with requisite contextualization in the Transforming Aspirational Districts programme driven by NITI Aayog, and captures the design and implementation components of the project. The DELTA SOP and Training Manual developed by Tata Trusts can be referred to for an insight into the thought process and approach of the various components of the framework.

Acknowledgments

The Trusts acknowledges the partnership opportunity provided by the NITI Aayog to leverage its in-depth experience of DELTA - a technological innovation promoting data-intensive micro-planning and development process led by its Data Driven Governance initiative. Tata Trusts acknowledges the critical support of the officials from NITI Aayog, local governments, the block and district administrations for facilitation of the project, the enthusiastic support meted by the communities in the project areas, and the role of the partners in the initiative.

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Project in Brief

Tata Trusts partnered in 85 districts – spread across 27 states

Of which 35 are affected by Left-Wing Extremism #

- Non Left-Wing Extremism
- Left-Wing Extremism

# At present 106 districts in 10 states have been identified by the Government of India as Left-Wing Extremism (LWE) affected districts in the country. LWE organisations are the groups that try to bring change through violent revolution.
Tata Trusts engaged as a validation partner in 85 districts - spread across 27 states

- 1008 Anthropometric equipment
- 1300 team members and 13 expert agencies engaged
- Effective use of technology

Adaptation into 15 regional languages: Hindi, Oriya, Marathi, Assamese, Bengali, Gujarati, Punjabi, Kannada, Malayalam, Tamil, Telugu, Mizoram, Nepali, Urdu and Manipuri

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**Community Level**

- Head of Households: 96,418
- Learning outcome test (6-14 yrs): 14,438
- Women who are pregnant in last 6 months: 21,354
- Anthropometric measurements of children 0-5 years of age: 28,827

**Institutional Level**

- Government Schools: 6,273
- District Hospitals: 87
- Community Health Centres: 478
- Primary Health centres / Sub Centres: 3,360
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ABBREVIATIONS

ANM  Auxiliary Nurse Midwife
BDO  Block Development Officer
BEO  Block Education Officer
BGVS Bharat Gyan Vigyan Samiti
CHC  Community Health Centre
DC   District Collector
DDG  Data Driven Governance
DELTA Data, Evaluation, Learning, Technology and Analysis
DIOs District Information Officers
DM   District Magistrate
FREND Foundation for Rural Entrepreneurship Development
HDI  Human Development Index
HMM  Hero Mindmine
MIS  Management Information System
MP   Member of Parliament
NITI National Institution for Transforming India
NRC  National Register of Citizens
PHC  Primary Health Centre
PSU  Primary Sampling Unit
PPS  Population Proportion Sampling
RS   Random Start
SC   Sub Centre
SI   Sampling Interval
TAD  Transformation of Aspirational Districts
VDP  Village Development Plan
For India to develop as one of the world’s largest economic powers, it must focus on two critical things – improving governance and service delivery up to the last mile, and ensuring consistent growth across all regions of the country in a uniform and inclusive manner. The programme on Transforming Aspirational Districts aims to transform the discourse of development narratives in select aspirational districts of India by leveraging the spirit of competitive benchmarking. Launched in January 2018, covering 117 districts, the programme has received the highest political commitment with the Prime Minister launching it and each of the implementing states pledging support. This report documents the year-long journey of Tata Trusts, a lead implementing partner for the validation exercise, as it prepared to conduct the data collection in each of the 48 villages/ward per district. The report is engaging as it tracks the experience of technical teams, decision-makers, trainers, enumerators and community members. Through case studies, testimonials and accounts, it throws light on the challenges faced on the ground as also the remedial measures and lessons learnt. Highlighting achievements reinforces the relevance of such a massive effort and how multiple agencies were pressed into action under the spirited guidance of the state and district administrations. It hopes to serve as an insightful document that can be of use to those wanting to understand the design of multi-layered development interventions in India, and to those wanting to replicate similar initiatives.
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India's growth story has demonstrated many models of success. However, there are still inconsistencies in the overall development of the country with some states and certain pockets trailing on critical social and economic indicators. High levels of diversities are seen in the living standards of people across states. With marked inter-state and inter-district variations, there is an urgent need for a programme like the Government of India's ‘Transformation of Aspirational Districts’ (TAD) that focuses on underdeveloped pockets to bring greater homogeneity and balance across population groups. The TAD programme aims to quickly and effectively transform the socio-economic status of 117 districts spread across 27 states. The areas that it covers include health and nutrition, education, agriculture and water resources, financial inclusion and skill development, and basic infrastructure. The programme identifies a total of 49 key performance indicators to measure the progress of districts and allows programme managers an easy tool to assess, evaluate and benchmark their performance. Using the paradigm of “aspiration”, districts are encouraged to first catch-up with the best district within their state by improving their worst performing indicators and then to set their sights on becoming one of the best in the country. Healthy competition between districts is encouraged and a ranking system developed to track how they are performing with respect to one another.

Key drivers of TAD

States are the main drivers in the TAD programme, which focuses equally on three major thrust areas, namely “convergence” (Central and State Schemes), “collaboration” (Central, State level ‘Prabhari’ Officers and District Collectors) and “competition” among districts driven by a mass movement. National Institution for Transforming India (NITI) Aayog in partnership with the State Planning Department, Government of Andhra Pradesh has created a dashboard for monitoring real-time progress of districts. Under this initiative, District Information Officers (DIOs) who play a critical role in district implementation activities underwent training in March, 2018. The training covered the relevance and processes related to entering data on to the dashboard and generating Management Information System (MIS) reports. May 2018 onwards, ranking of districts commenced based on progress made using Data, Evaluation, Learning, Technology and Analysis (DELTA) ranking methodology on real-time basis. The dashboard was then made accessible to the public in order to help monitor progress of aspirational districts. Apart from being anchored by NITI Aayog at the Government of India level, individual Ministries assumed responsibility to drive progress of districts. For each district, a central Prabhari Officer of the rank of Additional Secretary/Joint Secretary was nominated while an Empowered Committee under the convenorship of CEO, NITI Aayog was notified to ensure convergence in schemes and address issues flagged by the Prabhari officers.
Role of Tata Trusts

NITI Aayog partnered with Tata Trusts to assist districts in improving data quality on key performance indicators through a household and institutional survey.

Tata Trusts, under the Data Driven Governance Initiative has worked extensively on micro-planning, data processing and use of technology to create dashboards for planning and monitoring in close coordination with State and District Administrations across India. DELTA is an inclusive development-planning framework developed by Tata Trusts that enables organisations/administration to use data and technology to drive development.

DELTA developed by Tata Trusts is an integration of data and technology, designed for use in the bottom-up planning process to drive effective governance. It is a methodology of data-based micro planning, built on experiences of integrating new age technology with traditional participatory appraisal (PRA) methods that can be used for creating a resource envelope for local development needs of the people and supporting decision makers for focused design, targeting and tracking of plans and schemes.

Its demonstration in four different locations and the Standard Operating Procedure developed subsequently, capturing experiences and variations has drawn significant attention and value from the governance perspective. Administrators and policy makers are using this effectively for planning and monitoring critical development indicators.

The underlying conviction was that, using DELTA would ensure the data that is produced and documented is reliable and credible; and thereby helps people in accessing government schemes and entitlements. Tata Trusts offered NITI Aayog support to develop a tablet-based survey, which delivered real-time dynamic data, reduced dependency on cumbersome digitisation and enabled easy access of reliable data to track the progress of the aspirational districts on quarterly basis.

The DELTA framework of Tata Trusts formed the foundation of NITI Aayog’s vision of using technology-enabled dashboard ‘Champion of Change’ to monitor incremental progress of critical developmental indicators against an agreed upon baseline of programmes/schemes being implemented for developing the aspirational districts. Thus, NITI Aayog expressed its willingness to partner with Tata Trusts in supporting the districts. This entailed designing the survey methodology, undertaking data collection and analysis for 85 aspirational districts of the total 117 districts identified under the TAD programme.

Strengths of the programme

A number of factors contributed in making DELTA programme a success, which included:

• A strong foundation of inter-linkages and cohesion between central planning entities and ministries.
• A good head start to the data collection process ensured with the buy-in of District Collector/District Magistrate.
• Support of a robust training schedule with locally relevant aids and materials.
• Leveraging DELTA application network of Trusts for data collection.
• A unique methodology designed to conduct 1,71,235 surveys at the household and institutional level.
• Smooth data collection by different implementing agencies setting an example for healthy collaboration and partnership.
• Effective use of technology–dynamic, thoroughly tested, customised app enabled with in-field randomisation of sampling.
• Technological inputs that speeded up the process of enumeration and made the data collection teams more confident and tech-savvy.
• Deployment of over 950 Saathis and volunteers from native districts having sound knowledge and understanding of local issues and developmental gaps.
• Interview with key respondents on critical data points associated with health, education, agriculture, financial inclusion and basic services.
• Engagement with around 13 expert agencies to execute the data collection at the household as well as institutional level.
• Adaptation of 15 regional languages to the survey tool and training to cater to 27 States and regional diversities and needs.
1 BACKGROUND AND CONTEXT SETTING

1.1 Understanding Transformation of Aspirational Districts (TAD): Conceptualisation and Relevance

One of the biggest challenges in India’s development story has been that of uniform and consistent growth. The regional disparities on several socio-economic markers have contributed to a scenario where on one hand, certain areas within a state have shown remarkable progress, while in underdeveloped pockets, there is still a lot to catch up. According to the UNDP 2016 Human Development Index (HDI), India was ranked 131 out of 188 countries. An analysis of the data revealed marked regional diversity in the country’s living standards, pointing towards significant inter-state and inter-district variations. A priority that is now on the agenda of policy makers, social economists and other think tanks is to get the country to move ahead on its HDIs by uplifting the districts that have so far shown relatively lesser progress in achieving key social outcomes especially in critical areas such as education, sanitation, livelihoods and environment.

To address this concern, the Government of India announced the ‘Transformation of Aspirational Districts’ (TAD) programme on the 75th anniversary of Quit India Movement on 9th August 2017. The programme was formally launched on 10th January 2018 with the Prime Minister addressing the Collectors of all aspirational districts to make the “sabka saath sabka vikas”
slogan (development with and for everyone) as the focal point of developmental initiatives. The clarion call given was to raise the living standards of all citizens and ensure inclusive growth for all. In line with this the aim of TAD was to expeditiously improve the socio-economic status of 117 districts from across 27 states and to:

• Quickly and effectively transform these districts by making development a mass movement
• Improve people’s ability to participate fully in the burgeoning economy
• Strengthen convergence of Central and State government schemes
• Ensure collaboration of Central, State level ‘Prabhari’ Officers and District Collectors
• Promote competitive federalism with districts as the fulcrum and states as key drivers
• Promote healthy competition through real-time monitoring
• Strengthen each district by identifying low-hanging fruits for immediate improvement, followed by measuring progress and ranking of districts.

Implementation Structure of TAD

The TAD Programme is anchored by the National Institution for Transforming India (NITI) Aayog which is the nodal body to lead the programme. The mandate of TAD programme necessitated NITI Aayog to receive high-level administrative support at every tier of its implementation. To fulfill this, officers of the rank of Joint Secretary / Additional Secretary have been nominated as ‘Central Prabhari Officers’ of each district for driving progress and acting as a bridge between the Centre and the State. States have set up committees under the chairmanship of Chief Secretaries and nominated Nodal Officers to oversee the Programme. An Empowered Committee with Secretaries of 13 Ministries under the Convenorship of the CEO, NITI Aayog has been notified to ensure convergence in schemes and to address specific issues and challenges highlighted by Prabhari Officers.

1.2 A nuanced approach to guide operationalisation of TAD

The basic strategy adopted to put TAD into action was to motivate States to be the main drivers by identifying their strengths and using them as a catalyst for their own development. The focus was on keeping track of the progress that they were making by measuring and ranking their performance to spur a healthy wave of competition across the five thematic areas – health and nutrition, education, agriculture and water resources, financial inclusion, and skill development and basic infrastructure.

Progress was tracked on 81 identified data points representing 49 performance indicators for these thematic areas in the “Aspirational Districts” identified and selected under the programme. For the purpose of ranking these districts modalities were worked upon and ‘Champions of
Change’ Dashboard created in partnership with the Government of Andhra Pradesh was utilised for monitoring the real-time progress of districts.

### 1.3 Selection of districts

TAD identified and reached a total of 117 districts across India using a set of key indicators. Districts were selected on the basis of a database collated following a transparent process. The Ministry of Home Affairs provided a list of 35 districts, which were considered in the aspirational districts. For district selection, the following secondary databases were used, to which weights were further attached.

<table>
<thead>
<tr>
<th>Databases</th>
<th>Sector</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landless households dependent on manual labour (Socio Economic Caste Census – Deprivation 7)</td>
<td>Deprivation</td>
<td>25%</td>
</tr>
<tr>
<td>Antenatal care (National Health and Family Survey (NHFS-4))</td>
<td>Health &amp; Nutrition</td>
<td>7.5%</td>
</tr>
<tr>
<td>Institutional delivery (NHFS-4)</td>
<td></td>
<td>7.5%</td>
</tr>
<tr>
<td>Stunting of children below 5 years (NHFS-4)</td>
<td></td>
<td>7.5%</td>
</tr>
<tr>
<td>Wasting in children below 5 years (NHFS-4)</td>
<td></td>
<td>7.5%</td>
</tr>
<tr>
<td>Elementary drop-out rate (Unified District Information System for Education (U-DISE 2015-16))</td>
<td>Education</td>
<td>7.5%</td>
</tr>
<tr>
<td>Adverse pupil teacher ratio (U-DISE 2015-16)</td>
<td></td>
<td>7.5%</td>
</tr>
<tr>
<td>Un-electrified households (Ministry of Power)</td>
<td>Infrastructure</td>
<td>7.5%</td>
</tr>
<tr>
<td>Households without individual toilets (Ministry of Drinking Water and Sanitation)</td>
<td></td>
<td>7.5%</td>
</tr>
<tr>
<td>Un-connected PMGSY village (Ministry of Rural Development)</td>
<td></td>
<td>7.5%</td>
</tr>
<tr>
<td>Rural Household without access to water (Ministry of Drinking water and sanitation)</td>
<td></td>
<td>7.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

### Tapping into the “aspiration” angle

After several rounds of consultation with various stakeholders, 49 key performance indicators were chosen to measure progress of districts. Districts were prodded and encouraged to first catch-up with the best districts within their state and subsequently aspire to become one of the best in the country, by competing with and learning from others in the spirit of competitive and cooperative federalism. Districts are now raising the bar and fixing their sights on higher goals. They are fast aspiring to transition from being the State’s best to the Nation’s best.

### Process and criteria for district selection

While districts have been selected on the basis of published data, states were allowed to suggest replacement of any district. This was to ensure that the selection process benefits from the suggestion of the States.

The effort was to not select a large number of districts from a handful of states since the goal was to ensure pan India coverage and presence without stretching human capacities and other resources.
A composite index was used to identify the worst 80 districts based on the performance of the above indicators, out of which the 30 most laggard districts were considered for allotment under NITI Aayog districts. Following which the next lot of 50 worst districts were allotted to different ministries so they could use convergent efforts to revive Pan India.

1.4 Real time monitoring of dashboard and ranking design

To carry out monitoring of real-time progress of districts through the ‘Champions of Change’ Dashboard, District Information Officers (DIO) had to be duly trained. On 23rd March 2018 an extensive training schedule was planned covering methods related to entering of data on to the dashboard and generating Management Information System (MIS) reports.

The process of real time monitoring of Dashboard and ranking design is outlined below:

- Creating a Dashboard and ensuring its management and maintenance by the State Planning Department, Government of Andhra Pradesh.
- Choosing data points from five sectors namely, health and nutrition, education, agriculture, basic infrastructure and skill development.
- Tracking progress on 81 data points representing 49 indicators under the programme.

1.5 Ranking the districts

One of the main strategies of the programme was to make sure district level teams had the advantage of existing data to help them refine their efforts and enhance impact. This helped rank districts in terms of progress achieved. The ranking is based on incremental change in performance indicators with the underlying goal to create healthy competition among districts in spite of the challenges they faced, like unexploited or weak resource base and deficit manpower at different levels due to difficult living conditions etc.

1.6 Partnering with Tata Trusts

NITI Aayog entered into a partnership with Tata Trusts, and other knowledge partners for validation of district level data and for collecting values for certain key performance indicators through a household and institutional survey. This data will be used for ranking districts and assisting them to improve their quality.

Through the Trusts’ partnership with NITI Aayog, Tata Trusts got entrusted to validate the performance of 85 out of a total of 117 aspirational districts using a predefined set of indicators through quarterly surveys. Tata Trusts is implementing the project through its Data Driven Governance (DDG) vertical supporting on two fronts:

- Validation of survey in 85 districts and handing over data to NITI Aayog.
- Promoting a culture of data driven planning in the administration.

To this effect Tata Trusts leveraged its network of partners at the state and regional level for mobilising and training the ground level local teams on data collection.
Trusts’ responsibilities include on-ground monitoring and assessment support on the 49 pre-defined indicators across the five development domains in these 85 districts driven by DELTA methodology. The project is using just one part of DELTA in the form of digital data collection.

Tata Trusts plays a key role in ensuring seamless implementation of the exercise through regular engagements with state and district administrations, both on administrative and technical aspects of the survey roll-out and ranking methodologies.

Figure 2: Trusts presenting DELTA framework on 6th April 2016
A robust implementation framework and use of DELTA methodology helped address lacunae in government systems such as those of top-down development planning, inefficient public service delivery mechanisms and gaps in fund allocation responsible for reduced development outcomes.

2.1 Data Driven Governance: An initiative promoting data-based planning and development

According to the UN Data Revolution for Sustainable Development, in order to move towards “a world that counts”, the importance of accurate, transparent, integrated and real-time data collection and analysis mechanisms cannot be undermined. Because of its detail, timelessness, ability to be used for multiple purposes at scale, and to make large portions of low income population visible, the potential for data-driven development is unprecedented.

Drawing inspiration from the above, Tata Trusts forayed into the world of data-driven governance in 2015–16 through development and deployment of the DELTA framework of micro-planning, as a tool to drive ground up participatory planning. The initiative seeks to provide directed technology and capacity building support to rural and urban decision-making systems, and inculcate data as a way of life in the delivery of government planning and services – thereby creating significant impact for underserved and marginalised communities.

In 2015, Tata Trusts set partnerships with various Central Ministries, Line Departments at the State, District and Block level, and Members of Parliament (MPs) working in the area of data to explore technology-backed models, which support evidence-based decision-making. This process coincided with the ‘Sansad Adarsh Gram Yojana’ (Model Villages Programme), a flagship scheme unveiled by the Prime Minister of India in October 2014. Under the scheme, MPs were assigned the responsibility to develop one model village in their constituency by the year 2016 and two more such model villages by 2019.

Tata Trusts’ first experience of applying DELTA was in Vijayawada district of Andhra Pradesh with the support of the local government (engaging with District and Block Level entities) to drive sustainable community development. Later DELTA was launched in three other districts of Balasore (Odisha), Noamundi (Jharkhand) and Chandrapur (Maharashtra) where the various facets of data capturing and planning were further strengthened. Collectively, the four pilots resulted in 1200 village development plans (VDPs), available in the form of interactive dashboards for use by decision-makers and policymakers. Out of these, 780 VDPs were adopted by the administration to determine focus areas and to roll-out the associated schemes. Data was collected for 17 lakh people for which, 3200 volunteers were trained to administer questionnaires.
The DELTA framework of planning met with a reasonable amount of success in the four pilots, which thereafter saw traction at national level. It is now being implemented at scale across the state of Maharashtra by the Village Social Transformation Foundation (VSTF) in over 1000 Gram Panchayats creating models of data-driven development planning in the country. DELTA became a core tool in the Jamshedpur-Kalinganagar corridor (JKC) for data compilation due to the significance it gained in bringing about decentralisation in the real sense, by enabling rural communities to identify, prioritise and plan their local development needs. It also allowed policymakers to make plans that were relevant to people’s needs, as well as to optimise resources and ensure effective governance and service delivery. The most recent initiative relates to adoption of the DELTA framework as the foundation for the “Transformation of Aspirational Districts” initiative of the NITI Aayog.

2.2 What is DELTA and how does it improve governance

The Tata Trusts DDG initiative works extensively on primary and secondary data and uses technology to create a dashboard for planning and monitoring of public service delivery systems in close coordination with state and district administrations across India. DELTA, which is a methodology for collecting information from villages and Government departments provide analysis before presenting it on a dashboard that can be used to optimise resources, prioritise activities and track the progress of development.

The DELTA approach focuses on the following key parameters:
• Digital medium of data engagement with technology-enabled data collection, analysis and tracking.
• Data collection through ground volunteers identified from within communities.
• Institutional strengthening by identifying gaps and ensuring government ownership of VDPs.
• Larger on-ground impact with last mile linkages with government entitlements and schemes using live tracking.
For obtaining indicator level data quarterly survey in 85 districts was envisaged at two levels, namely household and institutional. Before the rollout designing of survey methodology, identification of districts, development of questionnaires and training of field teams on qualitative methods to record information was completed.

3.1 Survey methodology

The survey methodology involved following steps.

1. Tool development and finalisation: HH level questionnaire designed by Knowledge Partner; Institutional tools finalised in consultation with development partner of NITI Aayog.

2. Village/Ward selection: In every district, 48 villages/wards selected based on rural-urban population proportion of the district using Census 2011.

3. Village segmentation: In equal parts/clusters.

4. Household selection: Selected from listing of all households in the cluster.

5. Respondent selection: Eligible members from selected households.

### 3.2 Sampling protocol

#### Target group stratification

In order to cover all the indicators at household level the information was captured from multiple target groups, which were classified in the following categories:

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Category of households</th>
<th>Strata</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health - 1.1 to 3.2</td>
<td>Households with a woman who completed a pregnancy recently</td>
<td>Strata 1: Households with a woman who completed a pregnancy recently (last one year)</td>
</tr>
<tr>
<td>Health – 6.1 to 6.3 and 10.1 to 11</td>
<td>Household with mother of 0-2 years child</td>
<td>Strata 2: All other household members</td>
</tr>
<tr>
<td>Health - 4.1 to 5 and 7 to 9.2 and 12.1 to 13f</td>
<td>Household with mother of 0-5 years child</td>
<td></td>
</tr>
<tr>
<td>Education, agriculture and water resources, financial inclusion and skill development, basic infrastructure</td>
<td>Head of the household (male or female)</td>
<td></td>
</tr>
<tr>
<td>Facility level indicators – 13a to 13d, education – 3,5,6</td>
<td>Public health facilities and schools</td>
<td>All facilities in selected villages</td>
</tr>
</tbody>
</table>

With the aim of ensuring representation and to provide sufficient statistical power, two separate strata were conceived considering low prevalence of households with a woman completing pregnancy in last one year in a village. Women with recent pregnancy episode were considered as Strata-1 and all other categories of household listed above were considered as Strata-2. In order to construct a sampling frame for the above strata, listing and mapping of households in selected villages were planned. The list of households in these two strata would form sampling frame for their selection and would be used later for calculating weights. (Refer annexure 1 for sampling formula)

### 3.3 Sample size

With these assumptions, total sample for two strata is mentioned in table below.

<table>
<thead>
<tr>
<th></th>
<th>Approx. 228, rounded off to 240</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sample for Strata 1 (based on suggested formula)</td>
<td></td>
</tr>
<tr>
<td>Sampling frame</td>
<td>Listing of 200 households per selected village</td>
</tr>
<tr>
<td>Sample per selected village</td>
<td>5</td>
</tr>
<tr>
<td>Number of selected villages*</td>
<td>48</td>
</tr>
<tr>
<td>Total sample for Strata 2 (based on suggested formula)</td>
<td>Rounded off to 960</td>
</tr>
<tr>
<td>Sampling frame</td>
<td>Listing of 200 households per selected village</td>
</tr>
<tr>
<td>Sample per selected village</td>
<td>20</td>
</tr>
<tr>
<td>Number of selected villages*</td>
<td>48</td>
</tr>
</tbody>
</table>

*represent same villages
3.4 Use of technology for data collection and its monitoring

Data collection was carried out through a mobile-based application, which catered to the DELTA framework, equipped with smart phones along with a broadband connectivity. The application is functional in 2G and basic Android phones, having features enabling smart data collection, real-time monitoring and analysing the data.

For the purpose of monitoring, a customised dashboard was created, wherein; a bottom to top approach has been followed right from the data collector level to the project management person. An access link was provided to the programme management team to monitor the number of surveys completed against the target set in each geographical location, the progress and the lag and the time taken. The data access creates an easy monitoring system for the project manager and project head of the Tata Trusts to report any issue in data collection to the field team. Thus regular monitoring of real-time data collection took place at all the levels ensuring the quality and reliability of data.

The app worked out to be cost-friendly, efficient and its features such as less turnaround time helped in capturing the time span of data collection. In case an unusual time span for an interview was reported, the application would recommend resurvey and the same message popped-up to the back check team. This feature of survey error handling system is distinctive in DELTA app that helped in minimising data error to zero. On the whole, the tech-based survey monitoring system kept the data collection on the right track.

To keep the surveyors motivated in collecting data and to achieve their targets, precautionary measures were taken to avoid bugs, crashing and hanging issues in the app and ensure that it had zero error and was flawless in terms of expectations. In case of any change it was ensured that the process was smooth, it did not affect any work or the data was not lost. All this was important to win the trust and confidence of surveyors/ investigators for efficient data collection.

Maintaining the security and confidentiality of data was a top priority for which the app had built in features. For instance, to avoid data loss, the collected data got saved in the device and upon connection with the internet it got uploaded on the data server. Sending data on the server also ensured that the data was getting stored in a secure manner.
With better understanding of the data collection methodology all implementing partners were brought on board with clearly defined roles and responsibilities. They were the backbone of the programme providing direction, valuable insights and committed delivery on each of the implementation steps.

4.1 Implementing partners and their roles

The most significant part of the TAD process entailed ensuring a well-planned groundwork since collection of all the quantitative data depended on this initial step. Under the initiative, Tata Trusts partnered with Foundation for Rural Entrepreneurship Development (FREND) for the on-ground field surveys, which further leveraged its network with reputed grassroots NGOs working at regional/local level.

The TAD initiative got rolling due to the successful partnership it entered into with five different agencies, a research consultant from Craft Consultancy and one technical partner who were engaged reach out to the beneficiaries in all 85 districts.
Overall administrative partner

Administrative partner (Foundation for Rural Entrepreneurship Development-FREND)

Tata Trusts and FREND worked out a joint partnership for overseeing and coordinating the roll out and the implementation structure of the survey process. FREND tied up with BGVS and several other organisations with deep reach at the grassroots for executing the survey. Its responsibilities spanned coordination work not limited to the partners working on ground but also multiple partners like the technical teams of Dhwani and HMM. This included handling of all administrative tasks and ensuring that trainings were taking place as planned.

At the field level, it worked out meetings with the state/district administration to avoid possible challenges.

FREND is structured as a section 8 company, supported by philanthropists and corporate with a mission “to create a reliable network of technologically empowered individuals for socio-economic uplift of Rural India.” It has been created as an extension of Internet Saathi to help facilitate digital literacy among women in rural India and thereby bridge the deep online gender divide.

Tata Trusts leveraged this experience of FREND in creating and working with a team skilled in handling tech-based survey.

Internet Saathi: Bridging digital divide

In 2015, only 1 out of every 10 Internet user in rural India was a woman. Tata Trusts and Google came together to address this huge gender gap and introduced a digital literacy program based on ‘train the trainer’ model. Women from villages are trained on using the Internet and are made equipped with data-enabled devices. These women are known as Internet Saathis and work as trainers to help other women in their village to get started on their Internet journey and benefit from it. As of April 2019, there are more than 81,500 Internet Saathis who have helped over 28 million women learn about the Internet across 2,89,000 villages.

Field implementation partners (Bharat Gyan Vigyan Samiti)

BGVS acted as an implementing agency in the TAD project where it covered data collection in 59 districts. BGVS has been an implementation partner in earlier DELTA engagements of the Trusts in Balasore, Jamshedpur-Kalingangar etc. Their experience of engaging with the DELTA framework during its pilot years was leveraged in addition to their geographic presence in the TAD engagement.

The organisation was set up in 1989 with the aim of bringing about changes in the social order but later began working for the economic development of marginalised communities. Their work is directed towards reducing disparities and gaps that exist in society and their focus is on promoting a scientific bent of mind and spirit among its target groups. Its outreach extends to 22 States, 306 Districts, 2,009 Blocks and 21,064 Panchayats across the country with a membership of more than 2,70,535 people. In most states, it has a mass base character with state units that are independently registered with proportional women representatives.
Its focus is on adult literacy and total literacy, taking science to the people and facilitating development in health, education, gender, micro-level planning using DELTA and sustainable rural livelihoods. Apart from its work on adult literacy and training, BGVS has successfully undertaken skill enhancement programmes in agriculture, water management, health, research study and preparation and implementation of VDPs through Panchayats. It has done this with the support of different central and state ministries and departments, UNICEF, national and international organisations and corporate bodies.

Other implementing partners

For executing the survey in remaining 26 districts, FREND collaborated with grassroots NGOs with significant outreach and understanding of their region. These included Association for Sarva Seva Farms (ASSEFA), Mahila Arthik Vikas Mahamandal (MAVIM), Child in Need Institute (CINI), Centre for MicroFinance (CMF), Centre for Microfinance and Livelihood (CML), Centre for People’s Forestry (CPF), Dharma Life, Digital Empowerment Foundation (DEF), Ekjut and Partnering Hope into Action (PHIA). (Refer annexure 2 for the list of all implementing partners)

Technology partner (Dhwani Rural Information Systems)

Dhwani was invited to join the initiative given its experience of bringing technology to make rural areas more efficient and tech-friendly. It was tasked with developing the mobile-based DELTA survey application and dashboard to make data efficient and accessible. Dhwani supported the TAD team in two ways – in developing the mobile application to collect data and in creating the dashboard to monitor survey findings.

Dhwani, based in Delhi, was founded with the intent to promote the use of technology in social development sector and to encourage organisations to leverage its benefits for enhancing the effectiveness of their project implementation processes. To facilitate this, the organisation started providing customised technological services for the social sector organisations. The primary business of Dhwani is to develop tools for collecting real-time data and create monitoring processes for tracking the progress of projects, create dynamic maps, generate visual reports and develop dashboard and application to assess the project.

Training Partner (Hero Mindmine)

Hero Mindmine (HMM) has been involved mostly in carrying out training preparations, facilitation and conduct of training.

HMM a part of Hero Enterprises having nearly two decades of experience in training and consulting industry is an ISO 9001:2015 certified organisation. With a team of more than 150 professionals spread across all major cities in the country, they are working towards identifying right talent, building capability and assisting businesses in transforming through people development. Hero Mindmine has catered to more than 1400 unique clients across varied industry sectors and trained people and facilitated project management at all levels starting from the ground staff to the top management.
Language Partner (Translang Ways)

The organisation provided support in translating survey tools, project materials, questionnaires and training manuals from English to Hindi and other regional/local languages. Translation was done for 15 languages to cover 27 states.

Translang Ways has served FREND since its inception. Some of their projects include with NITI Aayog, Internet Saathi and NCERT for which they provide language services. They also have a long association with Tata Trusts. They are among the top five language service providers in India. They commenced operations in 2010 with the vision to help overcome all language barriers faced by business owners and have since grown to include a wide range of language related services in manufacturing, pharma, artificial intelligence, media and entertainment, research, finance and government.

Knowledge partner (DevInsights)

New Delhi based DevInsights was entrusted with the responsibility to develop the TAD process document and other knowledge products. A team of documenters made regular visits to get first-hand information about the various project components such as volunteer’s training and roll-out of survey. As a social research organisation, which has a dynamic group of development professionals with diverse set of skills ranging from research, evaluations, analytics, communication, documentation, training and implementation they contributed with valuable insights as they sought information to complete the process documentation.

Research partner (Craft Consultancy)

Craft Consultancy is a Bangalore based research and consulting organisation that was registered in 2013 with a vision to provide tactical solutions to business and social organizations with focus on quick turnaround and quality. It offers one stop solution for all research requirements in the domain of Communications, Evaluations, Impact Assessments, Measurement & Ranking, Baseline and Need Assessments using Qualitative and Quantitative research methodologies and advanced analytical methods. Craft Consultancy is a trusted research partner for some of the leading organisation including Centre for Catalyzing Change, Amity University, IPE Global, BBC Media Action, Care India, Grameen Foundation, Google Inc and Tata Trusts funded Internet Saathi program.

4.2 Key milestones and timeline

The average time taken to complete the TAD survey was three months, emerging more like a quarterly survey. Before the first quarterly survey was conducted, it took two months to finalise the indicators, tools/ questionnaires and design. Following that, the mobile application was developed, tools translated, and survey team trained.
Activity timeline

<table>
<thead>
<tr>
<th>Sr no.</th>
<th>Activity</th>
<th>Stakeholders involved</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Finalisation of indicators</td>
<td>NITI Aayog, Ministries, Tata Trusts including development partners</td>
<td>2-3 Weeks</td>
</tr>
<tr>
<td>2</td>
<td>Finalisation of questionnaire</td>
<td>NITI Aayog and Tata Trusts including other development partners</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Developing survey tool design and mobile app</td>
<td>FRENDC, Research Consultant from Craft Consultancy, Dhwani, Tata Trusts</td>
<td>35 Days</td>
</tr>
<tr>
<td>4</td>
<td>Translation of survey tools</td>
<td>FREND, Translang</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Capacity building of field team</td>
<td>FREND, HMM</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Implementation of survey</td>
<td>FREND and its 13 implementing partners</td>
<td>40-45 Days</td>
</tr>
<tr>
<td>7</td>
<td>Liaisoning with Government officials</td>
<td>FREND and its 13 implementing partners, Tata Trusts</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Calculating, processing and vetting of data</td>
<td>FREND, Dhwani, Tata Trusts, Research Consultant from Craft Consultancy</td>
<td>10 Days</td>
</tr>
<tr>
<td>9</td>
<td>Handing over data to NITI Aayog and presenting findings</td>
<td>Tata Trusts, FREND, Research Consultant from Craft Consultancy</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Sharing data and discussing with ministries/state governments and district administration</td>
<td>NITI Aayog</td>
<td>1 month</td>
</tr>
</tbody>
</table>

4.3 Human Resources

Tata Trusts, in partnership with FRENDC and BGVS conducted the survey in 84,672 households across 4,032 villages and wards in 85 districts of 27 states.

A total of 1300 people have been deployed, including managerial staff and 950 Saathis who were working on the ground. The ground level implementation team included a Project Officer at FRENDC level, State Coordinators coordinating activities in two to three states depending on the number of districts, District Coordinators who are responsible for district supervision, Block Coordinators and Saathis working under the Block Coordinators.

Overall, the team comprised of ten Saathis, two Block Coordinators and one District

![Team Structure](image-url)
Coordinator in each district. In hilly terrain and remote districts, the total number of Saathis was increased as per need. The figure below describes the human resource structure that was deployed across India.

![Diagram showing human resource engagement]

*Figure 8 Human resource engagement*
A meticulously designed training curriculum catered to every rung of the designated human resources, which was then duly supported with easy-to-comprehend training materials and manuals ensuring high impact and retention of instructions.

Effective development planning is incumbent on good quality data. This inevitably depends on the rigorous training that is provided with a view to creating a common understanding within the team with respect to project objectives; roles and engagement of the respective team members.

5.1 Training of survey team

A three-tier training programme was conceptualised to ensure streamlined data collection in all the project districts. This helped implement the programme as per plan and to meet the proposed deadlines.

First round of training

A two-day residential training was undertaken in Gurgaon for 11 Master Trainers. This was conducted jointly by HMM, the training partner and Tata Trusts.
Second round of training

As many as 12 batches of District Coordinators were trained in 11 locations across five zones. These zones were divided on the basis of geographical areas in North, South, East, West and Central zone.

District Coordinators and Enumerators were trained on DELTA as well as a unique mobile DELTA app developed by Trusts to capture data digitally on ground and the dashboard to monitor survey progress and its quality.

Non-residential training

A 3-day non-residential training of Saathi’s and volunteers was done in the respective districts by the District Coordinators.

Telephonic training

This training covered aspects related to house listing and providing important must-do’s to the data collectors in each district.

Team formation training on project perspective and skill building

The structure for the team selection and its formation got due precedence, which followed other steps:
• A State Coordinator was deputed for the larger states like Bihar, Odisha and MP covering more than six districts each in the ambit of research.
• Those states from which only two districts were to be surveyed, a Cluster Coordinator was designated.
• Participation of women enumerators was given importance since many questions related to women’s issues and their health.
• Training was conducted to address technical issues and leverage understanding of ground matters.
• Participation of grassroots organisations helped enumerators and coordinators in carrying out a more thorough round of data collection.
• Training support from the FREND team in various locations strengthened the data collection process.

District-level training

The district level three-day training programme was a comprehensive exercise, which provided guidance and inputs on all aspects related to data collection and conducting of interviews.
Orientation and background

A brief orientation was provided to the enumerators on the background of the survey and the scope of work.

Protocols and code of conduct

Volunteers were advised to follow the general protocol while conducting the interview such as how to connect with respondents prior to initiating the survey; seeking permission; assuring confidentiality and privacy especially in case of pregnant women.

Specific information

Sections on health were taken up in the institutional survey in detail. Providing information on aspects such as the multiple types of health institutions at different levels of society; nature of sub-centres (SCs) found in small villages where population was mostly around 3,000 to 5,000; primary health centres (PHCs) found in large villages where population ranged between 20,000 to 30,000; Block level community health centres (CHCs) which catered to the needs of 0.8 to 1.2 lakh people; and at district level how the overburdened district hospitals managed their day-to-day operations. Volunteers were advised to cover all SCs and PHCs from identified villages where household surveys were to be conducted. In addition, all the CHCs aligned or catering to the wards / villages selected for survey were covered and one district hospital was also surveyed.

Demo sessions and role-play

The data collection team should be proficient in theoretical aspects as well as the required soft skills and confidence for conducting the survey. Hence the training design took into consideration a practice session where participants could learn by doing on the demo DELTA app. This activity was well received and it ensured that each volunteer had clarity on how to conduct the survey.

Figure 11 Demo session
5.2 Survey tools

Household level

A comprehensive module with 120 questions covered the entire range of information that related to demography, occupation and livelihood status, health and educational level of children. Two types of households were covered with Strata-1 households including pregnant women and Strata-2 households which did not have pregnant women.

Institutional level

At this level the entire hierarchy of the functional institutional mechanism was covered.

Primary Health Centre
- The information sought included accessibility information, conversion to Health and Wellness Centre, referral services, manpower, diagnostic services and PHC performance data.

Community Health Centre
- It sought information on access to CHCs and PHCs, referral services, infrastructure, manpower and diagnostic services.

Health Sub-centre
- This included population covered by the SC, conversion to Health and Wellness Centre, referral services, manpower and diagnostic services.

District Hospital
- Availability of specialist and support services, manpower and Indian Public Health Standards compliance.

School Survey
- It aimed to find the enrolment details, availability of toilets and the source of drinking water.

Measuring instruments
- The volunteers were guided on the use of measuring height and weight of a child from 0-5 years of age through a process called anthropometry. Each volunteer was given a toolkit to use during the survey.

Digital weighing scale
- The scale had a capacity of 200 kg capacity and it weighed 0.01 kg. It was used to weigh children and adults.

Standometer tape
- This was a handy tool to measure the height of children below two years of age and adults.

Infantometer
- This was used to measure length of the child below two years of age.
A part of the training focused on preparing volunteers ready for the field by introducing them to each of the survey tool and measuring instruments likely to be used at the household and institutional level as well as the training manual to ensure all guidelines were followed.

**WhatsApp as a medium to clarify queries related to use of measuring instruments**

In many instances volunteers reported difficulty in using the measuring instruments. To overcome this problem their functioning method was shared on WhatsApp with the enumerators.

**Role-plays that brought alive hypothetical scenarios**

A role play was conducted after each volunteer presented a recap of what was discussed during the day. They were divided into pairs and a role play activity was conducted in which one person became the enumerator other respondent and vice versa for two components. After the activity, they were asked to share their observations and doubts regarding the survey. The selection criterion to select schools was also explained.

In another role play, volunteers were divided into pairs with one person becoming the enumerator and other playing the role of respondent and vice versa for two components. A major dialogue on all segments of the household component was discussed. While doing group work they were divided into two groups with each asking the other questions and awarding one another points on providing correct answers.
Training manual

An easy to read, illustrated and designed Training Manual was handed over to each volunteer for reference. This served as a guidance document while conducting the survey providing clear directions on the household and institutional surveys as well as the methodology required to use and upload the survey information on DELTA app.

Guidelines to enumerators

General guidelines were given to Enumerators so that they could conduct the interview smoothly and as per protocol. Important do’s and don’ts were flagged:

- Be neutral during the interview
- Never suggest answers to the respondent
- Do not change the language or sequence of questions
- Handle shy respondents tactfully and use diverting tactics
- Do not form expectations
- Do not hurry the interview
- Ensure confidentiality of respondents and tools
- Be careful not to suggest one response over another
- Probing should be used to obtain a clearer or more complete answer
- Ensure the responses are not influenced
- Complete callbacks for pending interviews with prior planning

*Figure 13 Checklist of do’s and dont’s*
Once all the groundwork was completed and survey teams trained and permissions sought from relevant authorities the survey team was ready to get into the field and initiate the process of implementation equipped with both skills and enthusiasm.

6.1 Getting the buy-in of the District Collectors/District Magistrates

The survey was initiated after meeting the respective District Collectors (DC) and District Magistrates (DM) followed by a brief orientation about the real-time monitoring through the monitoring dashboard ‘Champions of Change’. The DCs were explained that for most of the data points the data was being collected by the district administration but there were certain indicators for which the data will be collected by survey agencies and the survey team needed support from their offices and line departments to ensure smooth conduct of the same.

Figure 14 Steps for completing the survey
6.2 Engagement with the line departments

At the district level the team worked in close coordination with four key departments - education, health, women and child (ICDS) and agriculture. The representatives at the ground, block and district level provided immense support in coordinating different activities. The team met respective district nodal officers to seek their cooperation in carrying out the data collection exercise.

![Meeting with District Nodal Officers](image)

**Figure 15 Meeting with District Nodal Officers**

In most of the places, the District Coordinators directly met the DCs/DMs and line departments for necessary permissions.

The district responses varied and have been categorised into three types:

<table>
<thead>
<tr>
<th>Supportive/Adaptive</th>
<th>Sought clarity</th>
<th>Reluctant</th>
</tr>
</thead>
<tbody>
<tr>
<td>The administration followed as per the letter issued by NITI Aayog</td>
<td>DM wrote back seeking clarity on the survey approach, role of the ground team and the support required</td>
<td>Few DMs expressed reservation and directed to meet State for further clarity</td>
</tr>
</tbody>
</table>

In few districts, the DMs proactively supported the survey by convening a common meeting of the heads of line departments and issuing a common directive to cooperate in the survey filling process. The Block Development Officers (BDO) and Panchayati Raj Institution officials were assigned the responsibility for providing the list of villages and institutions to be covered under the survey.
In few places, the District Coordinators met the heads of Education and Health department for further support and to collect the secondary data relevant to the programme.

6.3 Rapport building with community and local functionaries

The task of community mobilisation, rapport building, survey facilitation and finding simpler solutions to complex field situations was done by BGVS, FRENDF and other local organisations in their respective districts. The on ground presence for past several years helped in seeking village entry, mobilising communities and identifying the Block and District Coordinators, Saathis at the village level. The team spent around a month visiting different locations before initiating the actual groundwork and identifying the staff that would be engaged in the survey.

6.4 Selection of village and ward

According to the sampling methodology, in every district 48 villages/wards were selected. The bifurcation between the villages and wards was done on the basis of rural-urban population proportion of the district using Census 2011. The selection was done using the population-based population proportion sampling (PPS) methodology that looked at size of the population and is very similar to National Family Health Survey/ National Sample Survey sampling methodology

6.5 Village segmentation and sample selection

Village segmentation and sample selection adopted a three-stage sampling design.

**Stage 1: Selection of villages on the basis of systematic probability proportional to size (PPS)**
- Collate district-wise village list from Census 2011 data
- Calculate cumulative sum of the population sizes of villages
- Divide total number of villages in a district by number of villages to be sampled, to arrive at Sampling Interval (SI)
- Choose a random number between 1 and the SI, rounded-up. This would be the Random Start (RS)
- Calculate following series: RS; RS + SI; RS + 2SI; .... RS+(d-1)*SI
- Depending on the village size, it is possible that big villages might get sampled more than once
- Mark the sampled villages

**Stage 2: Selection of households**
- In the selected village list 200 households
- Select 5 eligible households (one with women with recent pregnancy) using systematic random sampling approach
- Select 20 households from other households using systematic random sampling approach

**Stage 3: Selection of respondents within each selected household**
- If there is more than one eligible respondent in the household then the selection were done according to simple random selection of eligible household members
6.6 Listing and mapping process

The listing was a critical part of the data collection process, which helped in documenting site-specific data. It entailed a three step process of mapping, transect walk and household listing.

**Step-1: Mapping**

On arrival to the Primary Sampling Unit (PSU), a pair of lister and mapper would draw a detailed map of the entire village with the help of key informants in the village - Panchayat members, senior citizens, school teachers or any other responsible member living in the area who was familiar with the selected area. Such a map allowed the team to get a dependable estimate of the number of households in the village as well as the optimal route plan in order to draw a sample from the village. The listing/mapping helped in creating a list and map of the following:
- All streets and by-lanes
- Street corners and landmarks.

![Figure 16 Detailed PSU map](image)

Different legends for different types of structures in carrying out the above and all the structured spots would be numbered on the map later while listing.

**Step-2: Transect walk**

As part of the mapping exercise the team on the very first day obtained information on the key informants in the village. The transect walk, which is an information-gathering exercise for describing and showing the location and distribution of key features and/or personnel in the given area was undertaken for the purpose.

**Step-3: Household listing**

Trained investigators under a supervisor’s guidance conducted the household listing in the
following manner. The listing started from the north-east corner of the segment and the required number of households was covered following a Right-Hand Rule. Listing in the link village was done if the households in the village were less than 50 households.

### 6.7 The main household survey

In the selected village 200 households were listed. Out of these the five eligible households (one with women with recent pregnancy) and 20 other households i.e., a total of 25 households were selected using a systematic random sampling approach.

A household typically was seen as a place where a person or group of persons lived and ate from the same kitchen for at least six months of the year.

**Figure 17 House listing process**

Lists of the selected villages and urban wards from Census Office, local Panchayat/ Municipal Office etc. was obtained and rapport building with the community was completed with the help of village officials, sarpanch, patwari, school teacher, BDO, Accredited Social Health Activist (ASHA), Anganwadi Worker (AWW) etc. After selection of the segment, all households falling within the village boundaries were listed. The listed information was collected from any adult member of the household, and in case no one was available at home, neighbours were requested to fill in the gaps and complete the information.

The figure below explains the selection process of the households/ institutions covered under the survey.

**Figure 18 Selection process of respondents**
6.8 Institutional selection

All public health facilities and schools in selected villages were covered under the survey. All CHCs, PHCs and SCs associated with the 48 villages were considered even if they were located outside the village. All government schools present in the village with a maximum of three schools belonging to primary, middle and secondary each were also selected.

6.9 Data compilation and analysis

The present DELTA ranking takes into consideration the values obtained through the data collected through the quarterly field surveys that are carried out by the district teams.

The data collected through these surveys got uploaded by using DELTA App. Each volunteer was given a User ID with password to upload the surveys. Every day the Enumerators saved the finished surveys via the application on the dashboard following which the District Coordinator monitored progress on a daily basis.

Once the data got collected and approved, it was analysed as per the analysis plan developed and agreed along the lines of key indicators as per the requirement of the validation study. FREND with support of Dhwani collated and analysed the data. The report thus prepared was handed to NITI Aayog by the Tata Trusts. The decision to whether share the data with concerned
ministries and district administration and upload it on the dashboard was the sole prerogative of NITI Aayog.

### 6.10 Field coordination and feedback mechanism

District and Block Coordinators supported the Enumerators in executing the institutional survey and resolving the issues related to survey execution. A backend team was constantly monitoring the progress of the data, and anomalies if any, were immediately informed to them through a WhatsApp group that was created for each state.

### 6.11 Monitoring quality in carrying out the survey

Data quality monitoring was ensured by making it a core responsibility of the District Coordinator and Block Coordinator. Additionally, various checks and balances were incorporated in the mobile application to prevent errors at source. Data quality was also being monitored at the central level with support of a Research Consultant from Craft Consultancy. Remedial steps to improve data quality became imperative such as resurvey of certain strata households or children or modification in options of questionnaire. The required direction and information was communicated after consultation by the central team that was working at FREND, to Dhwani for taking necessary action.
Systematic planning and organisation of all aspects related to data collection brought to the fore intrinsic strengths of the programme based on response from the field and experience of all those connected with the project.

A well-planned survey methodology guided the data collection. Based on review and feedback from the Enumerators and others on the ground several positive outcomes were seen. These were attributed to efficient planning, quick decision-making and close monitoring.

**Cohesion between line departments and ministries**

A good head start to the data collection process was ensured with the buy-in of the DC/DM. Their support and positive demeanour, especially in formally introducing the survey team to all officials of the respective line departments ensured that the process was initiated with gusto. Once the survey began, post a brief orientation for real-time monitoring through the ‘Champions of Change’, there was clarity in everyone’s mind on how the process would pan out. Once the district administrations were aware of their role and how it would contribute in streamlining data collection they assured full cooperation to enable the teams complete the survey within stipulated deadlines.

**Attention given to planning the preparatory phase**

A great deal of groundwork got covered in the preparatory phase of the project, which helped in timely roll-out of survey activities. A case in point was selecting local organisations that ensured easy access to various local communities, thus saving time in rapport building and mobilising the community.

**Participatory monitoring and governance**

The Project is a step towards participatory monitoring and governance where people were made part of the development process. Hence

“The training workshop provided a lot of clarity on technology, methodology, administrative support and to how we could specifically contribute to the data collection. This also helped us in planning on how to disseminate information to the Block Coordinators and Volunteers.”

Asha Mishra, All India Coordinator and Vice President, BGVS

“The survey conducted using DELTA app was a novel concept that tempted me to take up the assignment. The questions were simple and easy facilitating the interviews.”

Elina Mohanty, Enumerator, Odisha
it is in tandem with the Honourable Prime Minister’s vision of ‘sab ka saath sab ka vikas’ (development with and for everyone) and ‘less government more governance’.

**Meticulous designing of training plan**

Rigorous training which was the backbone of the programme helped create a common understanding within the team on the project objective, roles and engagement of respective team members. All levels of hierarchy both household and institutional were covered in a systematic and time-bound manner. Training materials, aids and tools were designed keeping each target group in mind. The simple and illustrative/practical demo-based nature of the training programmes ensured interactivity and absorption of key messages.

**Smooth data collection by different implementing agencies**

The first cohort of data collection was finished successfully. All implementing organisations were able to complete the data collection and respond to NITI Aayog’s guidelines without any overlap or duplication. The teams sat together and discussed the ground work, which was to be conducted in Quarter 1 anticipating hurdles and brainstorming on possible solutions. This kind of collaborative partnership strengthened the quality of data collection and nature of community interactions.

**Empowerment through use of technology**

There was a sense of novelty that came with adopting tech tools to conduct data collection. It made the Enumerators feel empowered more in sync with current trends and also gave them a sense of importance. All this contributed to greater enthusiasm in their interactions with community members and better outcomes.

**Becoming a change agent and experiencing a heightened sense of self worth**

*Rakhi Kumari, a resident of village Para Matihana, Jamui, Bihar had always wanted to compete with boys in every field. However, born in a backward village, with archaic customs where girls are forbidden to leave domestic peripheries, she could not stand up against her parents when they put pressure on her to marry early. Fortunately having a supportive husband who understood her desire to learn new things and be independent helped when she got an opportunity to work with the Digital Empowerment Foundation. The job entailed learning basics about computer and internet use and teaching the same to women in the village. She joined the Internet Saathi Programme and taught usage of smartphones to women and girls. Gradually she started getting recognised and appreciated for her knowledge. After the end of the Internet Saathi project, she got a chance to work with the NITI Aayog programme. Simultaneously, she continued to upgrade her skills. Today she is in a better paying job and is providing valuable support to her family, both in terms of financial resources and more importantly exposure to the outside world and to technology.*

Shared by Digital Empowerment Foundation, Bihar and MP
We operate in the LWE affected areas of Malkangiri. It is not at all easy working in these tribal districts. On one hand the threat of violence by extremists is always there and on the other hand there is pressure from the police. Tribal dialect is also an issue. We have hired volunteers from the villages itself that made our operations easy.

District Coordinator, Malkangiri, Odisha

Officials at the district administration were extremely supportive. They signed our ID cards and forwarded authorisation letters to all line departments so that we do not encounter any issue. In Kupwara district we were invited for a meeting when NITI Aayog released the first ranking in July. Later, we were again invited to a meeting with Block Coordinators where they asked us to make suggestions based on our field interactions/visits to improve delivery of services to the community.

District Coordinator, Kupwara, Jammu & Kashmir
Beginning with a single Gram Panchayat in 2015 the footprint of the Trusts’ DDG body of work now extends to 85 districts in 27 states under the NITI Aayog’s TAD programme and has covered a population of 2.5 million through on-ground sampled household surveys. This initiative also demonstrates how a technology-led model of governance can influence the development discourse positively in complex socio-political milieus with a legacy of low systemic performance and poor service delivery.

Trusts have played the role of a third-party validation to inform gaps on critical indicators, and the insights that emerged from periodic survey it has successfully taken forward to NITI Aayog. Through dedicated efforts by NITI Aayog and the Trusts a significant amount of ownership was generated towards usage of the published DELTA rankings in improving performance indicators at granular levels. The insights derived from the data provided districts with appropriate guidance to streamline district level planning and implementation processes towards targeted and streamlined service delivery. This has contributed towards a shift in DELTA rankings in subsequent rounds leading to visible development of the aspirational districts.

The adoption of DELTA by the NITI Aayog in this nation-wide benchmarking process and a similar buy-in from the respective state governments and district administration is a significant step in recognising the value of data in the governance process. Subsequently, the Trusts are planning to carry out district-wide household mapping surveys in association with the district administrations to provide the district leadership with a holistic picture of development needs and possible schematic linkages.

In a country where data is touted as the new oil, harmonising data sources through meaningfully designed platforms and tools is imperative to enable governments and citizens to use public development funds effectively. DELTA has evolved as an end-to-end decision support system to provide policy and decision-makers the necessary insights and guidance to improve district planning processes. We believe, this will not only help the district machinery perform with greater precision but also meet the felt development needs of communities and citizens in a targeted manner. Going forward evidence-based decision-making through concerted use of technology will be critical in the development discourse in the times to come.
ANNEXURES
Annexure 1: Sampling Formula

Strata 1: Women with recent pregnancy episode

The following sample formula was used to calculate the sample size for the strata 1 respondents:

\[
\text{Sample Size} = \frac{Z^2 \times (p) \times (1 - p)}{c^2}
\]

Where,

- \(z\) = standard normal value to achieve 95% level of confidence (1.96)
- \(P = 0.5\) for arriving maximum sample size
- \(c\) = margin of error expressed as decimal (assumed to be 6.5%)

Strata 2: All other household members

The following formula was used for household level surveys to arrive at a representative sample size for strata 2.

\[
4 \{(r)(1 - r)(f)(NP)\}/[\{(0.05r)\]^2 \times (p)(nh)}
\]

Where:

- 4 is the factor to achieve 95 percent level of confidence
- \(r = 0.5\) is the anticipated level (coverage) of the key indicators
- \(F = 1.25\) is the shortened symbol for design effect
- 0.65 is the margin of error to be tolerated, defined as 6.5 percent of \(r\)
- \(NP\) = Non-participant rate, assumed to be 5%. Hence, accounted for multiplier of 1.05
- \(P = \) proportion of the population, assumed and averaged to be for 0-18 years as majority of indicators pertain to general population and some are related to children
- \(nh = 4.5\) is the average household size
Sampling weights and multipliers

With aim to ensure the representativeness of the sample in terms of the size, distribution, and characteristics of the study population, sampling weights were calculated. This statistical operation is performed so as to reflect the actual situation in the population. The following steps were used for computation of the weights.

- The probability \( f \) of selecting a household is the product of (i) probability of selecting a village \( f_1 \) and (ii) probability of selecting a HH in the selected village \( f_2 \).
- (Probability of selecting a household) \( f = f_1 \times f_2 \);
- As Primary Sampling Units (PSUs) were selected with probability proportional to their population size with replacement (PPSWR), probability of selection of a PSU would be:

\[
 f_1 = \frac{(a \times p)}{p}
\]

Where,

\( a = \) Number of villages selected from the stratum
\( p_i = \) Population of the village as per Census 2011
\( P = \) Total population of the stratum as per Census 2011

Households within a village were selected using circular systematic random sampling. Probability of selection of a household would be:

\[
 f_2 = \frac{n_i}{L_i}
\]

Where,

\( n_i = \) Number households to be selected in a village
\( L_i = \) Number of households listed in the village of the ‘cluster’

The household level weight at ‘village’ level, is computed as:

\[
 w_i = \frac{1}{f_1 \times f_2}
\]

Where,

\( f_s = 1 \), for no segmentation of villages
In order to take care of differential response rates across the village, the design weight \( (w_i) \) has been divided by the response rate, i.e.:

\[
W_i = \frac{w_i}{R_i}
\]

Where,

\( R_i \) is the response rate achieved in the villages.

**Adjustment for over sampling in Strata-1**

In order to correct the oversampling in Strata-1 households weights of a village are to be normalised so that the total number of weighted cases is equal to the total number of un-weighted cases. This is done by multiplying the household weights by the ratio of total number of un-weighted cases to total number of weighted cases (obtained by applying weights before normalization to the number of cases in selected villages).

The final rural household weight in a state is calculated as:

\[
W_{nr} = \frac{(w_i \sum n_i)}{(\sum w_i \times n_i)}
\]
## Annexure 2: List of All Implementing Partners

<table>
<thead>
<tr>
<th>State</th>
<th>District</th>
<th>Partner</th>
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<td>CPF</td>
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Annexure 3: Challenges in Implementation and Lessons Learnt

Difficulties experienced in Q1

Since the periphery of the programme was massive and there was involvement of different stakeholders at multiple levels, the challenges that emerged were largely dependent on the situation and condition of that district.

Navigating hurdles encountered while managing the project, whether they related to volunteer selection, training and field management or coordination with government/partner agencies were addressed with timely reviews, discussions, brainstorming and suitable modifications.

Response to the data collection was encouraging with few issues reported from the field. Most of the challenges and lessons learnt during the period have been enumerated below.

Socio-economic-geographical challenges

“The socio-geographical situation of Northeast is different from rest of India, the kind of questions posed to them had to be relevant to their environment. For example, there is no Rabi and Kharif season in Northeast and people mostly practice Jhum cultivation. So the question had to be changed which the study team did once they became aware of the gap and missing information.”

Biplaw Ghosh, Cluster Coordinator for Manipur, Nagaland and Mizoram

“We faced problems in the team selection because of less honorarium. Since our district is predominantly tribal (Grasiya and Bhil tribes), there are plenty of organisations functioning here. Even those who are not literate get good salaries from their organisations. Finding a tech literate Enumerator for such less honorarium became a difficult task.”

Goma Ram Meena, District Coordinator, Sirohi, Rajasthan

Continuity in team identification due to frequent dropouts

The team identification process saw some hiccups due to high rate of volunteer dropout in several districts. Some of the field workers abandoned the survey midway since they were
assigned tribal hamlets in far-off interiors and found it time consuming to complete the process. In districts where the illiteracy rate was high, it was tough to complete the selection of Saathis. Here, Saathis were chosen on the basis of their proficiency in local language and some knowledge on use of mobiles.

Another reason for drop out that was cited related to insufficient honorarium.

**Delay in data collection due to climatic conditions**

The most frequently experienced issues that emerged from different districts during the process of data collection were related to poor electricity hindering usage of app, access due to inclement weather and remote locations, hilly terrain, conflict situations and a deteriorating law and order situation. Flood and water logging created problems in rainy season making communication difficult. Due to extreme weather conditions in Baramula and hostile conditions because of the terrorist attack in Jammu and Kashmir and heavily affected Naxal region in few districts of Chhattisgarh, volunteers were advised not to enter those areas. Similarly, volunteers were advised not to enter few villages coming under Indo-Bangla border in Manipur.

Duration of survey and the chosen time for conducting the same contributed to some delays and glitches. For example, during summer and winter vacations in schools survey could not be conducted. Also, in districts which got snowfall and were cut-off from other places, winters made it impossible to conduct surveys during that time. In Jharkhand, the team faced Pathalgary issue wherein villagers/Gram Sabha members did not give permission for the survey and for implementing any government interventions. Other problems faced by the data collection team were hesitation by few respondents especially pregnant women who did not give clear answers to questions relating to income and land ownership leading to inaccuracies in recording agriculture income, some in Northeast were reluctant to disclose their identity. The responses that were received from this area during that period were inconsistent. At other times when there were strikes and
“Chances of missing questions were less because after the end of the survey, all unanswered questions pop-up in red flagging those that need to be repeated. One major problem was that less women Enumerators could be identified, and this impacted interviews with pregnant women and where questions were women/gender-centric.”

Madhusmita Khuntia, District Coordinator

“A case of being at the wrong place at the wrong time

Anuradha Baruah District Collector of Udalguri district in Assam recounted that the main challenge faced by the team in the area was when the man-elephant conflict in the Tea Gardens of Udalguri was at its peak. During this time, the survey had to be done only during daytime. One of the Saathis while working on the field got stuck in a tense situation, which led to some disturbance in the village when an unpleasant crowd gheraoed her. Despite explaining to the villagers, she was denied entry for undertaking the survey. To make matters worse, she was taken to a room and locked-up. The villagers said they would release her only once the National Register of Citizens (NRC) had made their declaration, which was scheduled the following day. It was only after the local anganwadi worker convinced the villagers informing that the survey had nothing to do with NRC, that she was released.”

Babul Kumar Behera, Survey Volunteer

“Increase in survey time for a comprehensive coverage of respondents

The number of respondents who were supposed to be covered could not be completed due to which the Enumerators had to re-visit villages at times. This added to the allotted time period for completion of survey. The reasons for inability to cover respondents within the stipulated time ranged from non- availability of respondents; refusal on part of respondents to answer; and unavailability of children for anthropometric measurements since they were at school etc.
Technical issues due to unfamiliarity with the medium and patchy connections

App related work was new for most team members, especially Enumerators. Problem of power cuts and internet access proved as a major hurdle. In some cases, the device that the field team had was old and created problems while updating the version of the app. Data syncing and saving was a common hurdle, especially when the phone was switched off due to low battery or no connectivity. The toll-free number did not function at all times making it difficult for the field team to reach the technical team. There was an instance when the field team in Malkangiri was not allowed to take phones in the village since the area was politically sensitive.

Lessons learnt and actions taken

- Power banks were bought on installments by the District Coordinators to address the issue of battery dying in some areas.
- To counter data loss it was suggested that the questionnaire be divided into parts.
- Field teams urged the technical team to be available 24x7 during the survey days just in case any problem arose at any point in time.
- To avoid data loss during updation of the app field teams asked the technical team to notify them beforehand.

Aligning the district administration to survey process

From the beginning, 63 districts were already aligned and supported in the survey process. District Collectors in eight districts of Bihar and Odisha wanted letter and made it a mandatory condition to support the district team. The concern was addressed after the State Government issued a letter to the districts.

Trusts Officials visited Kupwara and Baramula (in Jammu and Kashmir); Khammam and Asifabad (in Telangana); Hailakandi (in Assam); Dahod and Narmada (in Gujarat) to resolve queries of the district administration regarding survey process.

In many places the team was not in regular touch with the District Collector’s office, and where they were, they did not always share the outcome of the meeting with rest of the teammates. This impacted both continuity and sustained goodwill.
Safety and gender related issues

“The main problem that arose in Jammu and Kashmir (J&K) is related to security and safety. Surveyors were not allowed to enter the village because search operations were going on. Identity cards issued to ground staff were not considered valid since they were in Hindi and surveyors were refused entry by the security personnel. Also, since the cards were handwritten, they were not given due weightage. It was only after officials from NITI Aayog contacted the district administration and an Army Major, that the team was allowed in. Most of the areas here are in the line of control areas, so the team was not allowed to survey after 4 pm. As women Coordinators, we also faced gender bias with many households showing resistance in responding to us”.

Fouzia, District Coordinator from Kupwara district, J & K and Shehla, District Coordinator from Bramullah district, J & K"

Gaps in reporting and monitoring

In the absence of a proper system of monitoring and reporting, it was not easy to keep track of every household survey. Since most of the reporting was based on what was inputted in recording sheets and computers it was not considered a real-time exchange of updates.

Issues with monitoring of quality

Issues with respect to monitoring the data quality were faced due to inadequate use of the dashboard. The team relied on excel sheet reports downloaded from the monitoring dashboard. This report however showed a bit lower value than that reported by the Enumerator to the District Coordinator, which sometimes created confusion about actual progress of survey. This happened as the system would take time for updation of the data obtained from the field. This problem was resolved after informing the issue to the concerned Coordinators.

Actions taken

- Few partner organisations deputed a State Coordinator in places having more number of blocks and a Cluster Coordinator in states with fewer blocks.
- A WhatsApp group was created for the core team, Cluster Coordinator group and an All India District Coordinator group along with state groups that had more number of blocks.
LESSONS FROM FIRST ROUND OF SURVEY

1. Letters should be dispatched from District Magistrate’s (DM) office to various state departments so that timely information can be disseminated.

2. Regular meetings with the district administration are needed to ensure smoother facilitation of work. Holding a formal meeting with the District Collector and sharing the agenda and project requirements would set the pace and allow the team to be updated on all aspects.

3. Cards need to be properly stamped and signed by someone in position of authority such as the District Magistrate of the respective districts.

4. Greater focus on capacity building measures required with respect to survey tools and monitoring dashboards by knowledgeable trainers and an upgraded version of the Training Manual that captures all required details and knowledge building materials related to the survey. Need to streamline communication system for quick and effective solutions for field problems and to avoid multiple messaging that is likely to cause confusion.

5. Apart from intense training, volunteers must be given motivation to continue. They must be discouraged from leaving the programme mid-way. Increasing the number of Saathis in hard-to-reach tribal hamlets and hilly regions was mooted.

6. Proper and accurate translation of training materials in different languages and in languages spoken in that particular area must be ensured.

7. Field teams must work closely with the technical team and ensure they are available 24x7 especially during survey days.

8. Need to ensure a quality-monitoring dashboard for finding data quality issues and rectifying them in a shorter time frame.

9. Modify daily progress monitoring report format and communicate the same with clarity.

10. To avoid data loss during updation of the app field teams must be instructed to coordinate systematically with the technical team and notify them beforehand when the app was being updated. This would help them to be prepared for situation where there would be patchy communication.