

REPORT ON

# Capacity Strengthening Training on Data Interpretation and Economic Outcome Analysis

29-30 May 2025 | Bhubaneswar, Odisha



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## Table of Contents

Acknowledgements .....	2
Executive Summary .....	3
Chapter 1: Introduction.....	4
Background and Context .....	4
Objectives of the Training Program .....	4
Profile of Participants .....	5
Chapter 2: Training Content, Methodology and Profile of Trainers .....	7
Training Content.....	7
Methodology of Training.....	8
Profile of Trainers .....	9
Chapter 3: Training Session-Wise Description .....	10
Chapter 4: Participant Feedback on the Training.....	16
Chapter 5: Key Outcomes and Takeaways .....	18
Key Outcomes from the Training .....	18
Key Takeaways from the Training.....	18
Chapter 6 : Valedictory Session .....	20
Annexure – I.....	21
Event Agenda .....	21
Annexure – II.....	24
Participants List .....	24

## Acknowledgements

The International Food Policy Research Institute (IFPRI) is pleased to extend its heartfelt gratitude to all those who contributed to the successful conduct of the ‘Capacity Strengthening Training on Data Interpretation and Economic Outcome Analysis,’ held on May 29–30, 2025, in Bhubaneswar, Odisha.

This two-day program brought together officials from various departments under the Department of Agriculture & Farmers’ Empowerment (DAFE), Government of Odisha (GoO), with the aim of enhancing their skills in data-driven decision-making. The enthusiastic participation and collective commitment of all stakeholders made this initiative both impactful and memorable.

Our heartfelt thanks go to the Gates Foundation for their generous financial support. Their contribution was instrumental in designing and delivering this capacity-building initiative aimed at enhancing the analytical capabilities of officials in outcome assessment, data interpretation, and agricultural policy analysis.

We would like to specially acknowledge our distinguished trainers—Dr. Devesh Roy, Dr. Mamata Pradhan, and Mr. Sunil Saroj—for their expert facilitation of the sessions. Their insights into the importance of robust data collection methods and analytical tools were both timely and relevant.

We also commend the tireless efforts of the IFPRI coordination team—Mr. Amit Kumar Burman, Ms. Vandana Vidhani, and Mr. Devendra Kumar—whose dedication ensured the seamless organization and management of the training.

A special note of appreciation is due to Sri Shubhranshu Mishra, OAS, Additional Secretary to the Government, DAFE, GoO, for his continued encouragement and vision. He emphasized the pivotal role of data in modern governance, remarking that ‘data is the new gold,’ and underscored that the future of the department rests with its young officers who must be equipped with the skills to make data-driven decisions. It is worth noting that the training coincided with the launch of the “Viksit Krishi Sankalp Abhiyan” by the Union Agriculture Minister from Puri, Odisha—underlining the timeliness and relevance of this initiative.

We also thank Dr. Sangram Keshari Pattanaik, Deputy Director of Agriculture, DAFE, GoO, for joining the inaugural session and reinforcing the importance of building institutional capacity in data analysis. We are grateful to Sri Nagendra Kumar Malik, Assistant Director of Agriculture, for emphasizing how data is essential not just for policy design, but also for adaptive and corrective actions.

To all the participating officials and development partners, we express our sincere appreciation. Your enthusiasm, insightful engagement, and commitment to learning were central to the program’s success. Finally, we thank Swosti Premium for their excellent logistical support and infrastructure, which contributed to the smooth conduct of the training.

This training was a true collaborative endeavor, and its success reflects the shared commitment to strengthening the capacity of public institutions through knowledge and teamwork.

## Executive Summary

The Department of Agriculture & Farmers' Empowerment (DAFE), Government of Odisha (GoO), in collaboration with the International Food Policy Research Institute (IFPRI), organized the second phase of the Capacity Strengthening Training on Data Interpretation and Economic Outcome Analysis on May 29–30, 2025, in Bhubaneswar. The training was inaugurated by Sri Subhramshu Mishra (OAS), Additional Secretary to Government, DAFE, GoO who emphasized the Department's commitment to building a data-driven culture among its field officers.

Building on the successful completion of Phase-I, which focused on foundational skills in data analysis, visualization, and policy evaluation, the second phase aimed to deepen participants' capacity to apply advanced techniques in real-world contexts. In Phase-I, participants gained hands-on experience with national datasets such as NSSO, PLFS, and the Agricultural Census, while working with tools like Excel, STATA, R, and Python. Phase-II was designed to reinforce these skills while introducing more practical and applied elements of data use in agricultural planning.

The training structure included:

- A refresher on key concepts from Phase-I.
- Designing questionnaires for primary data collection and using **Kobo Tools** for digital data capture.
- Practical demonstrations of data analysis using **STATA** and **Excel**.
- Techniques for data visualization and interpretation.
- Guidance on writing research papers and triangulating findings through quantitative and qualitative approaches.



*Sri Subhramshu Mishra delivering the opening remarks*

The training primarily targeted **mid and entry-level officials** from DAFE, along with **Monitoring, Learning, and Evaluation (MLE) leads** from development partners. The sessions aimed to equip them with the tools and techniques needed to integrate data-driven insights into their day-to-day work and policy recommendations.

By the end of the training, participants were expected to:

- Strengthen their ability to analyze economic outcomes using real agricultural data
- Apply advanced data interpretation techniques in program evaluation
- Reinforce and retain core concepts from Phase-I
- Translate analytical findings into evidence-based decision-making

This training marks another significant step in Odisha's journey toward institutionalizing data use and fostering a results-oriented approach in agricultural governance. It reflects the state's proactive efforts to empower its workforce with the analytical skills required to deliver on its agricultural transformation goals.

# Chapter 1: Introduction

## Background and Context

The DAFE, GoO recognizes the critical role of data-driven decision-making in fostering sustainable agricultural growth and achieving resilient farmer livelihoods. In line with this vision, the department, in collaboration with strategic partners, successfully completed the first phase of its capacity-building initiative: "Outcome Assessment, Data Interpretation, and Agricultural Policy Analysis." This initial phase was designed to equip departmental officers with foundational skills in essential areas such as data analysis, visualization, and agricultural policy evaluation. Participants gained valuable practical experience by working with diverse datasets, including those from the National Sample Survey Office (NSSO), Agricultural Census, and the Periodic Labour Force Survey (PLFS), utilizing various analytical tools like Excel, STATA, R, and Python.



*Dr. Mamata Pradhan setting the context for the training*

Building upon the strong foundation laid in Phase I, a clear need has been identified to further deepen the capabilities of field officers and development partners, specifically in advanced data interpretation and economic outcome analysis. This second phase of this training will transition from foundational concepts to practical application, focusing on equipping participants with the skills to interpret real-world agricultural data, conduct advanced economic outcome analysis, and effectively integrate these analytical insights directly into policy-making processes and field-level planning. This continuous investment in structured, high-quality capacity building underscores the Department's commitment to modernizing agricultural governance and ensuring that programmatic decisions are informed by robust evidence for greater impact on farmers' livelihoods in Odisha.

## Objectives of the Training Program

The primary objective of the second phase of this training is to significantly deepen the capacity of field officers within the Department of Agriculture, Odisha, in the crucial areas of data interpretation and economic outcome analysis. This comprehensive program is specifically designed to transition participants from theoretical understanding to practical application, enabling them to confidently analyze real-world agricultural data.

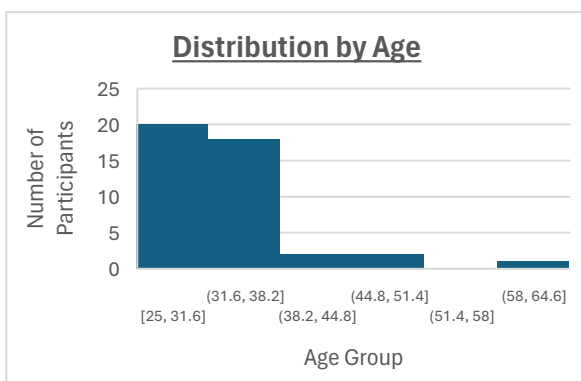
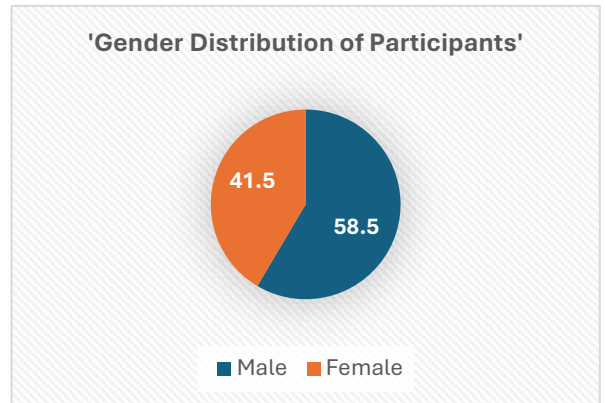
Through the introduction of advanced analytical techniques and a strong emphasis on case-based applications, the training will empower participants to derive actionable insights from complex datasets. This enhanced analytical capability will directly support their ability to make evidence-based policy recommendations, ensuring that agricultural interventions are precisely targeted and highly effective.

Furthermore, a key focus of this training will be the strategic reinforcement of concepts previously covered in Phase-I. This deliberate revisiting of foundational knowledge aims to ensure robust knowledge retention and facilitate the seamless practical application of all learned skills. By fostering a deeper understanding and practical proficiency, this phase will directly contribute to improving the overall data literacy and analytical capabilities of field

officers, thereby strengthening the Department's and partners' capacity for informed decision-making and impactful agricultural development.

## Profile of Participants

The training program witnessed participation from a diverse group of officers and professionals, representing a balanced gender representation. Out of a total of 43 participants, there were 17 female and 26 male participants. This reflects a 41.5% representation of women. Such diversity not only enriches the learning environment but also promotes inclusive perspectives in policy and program implementation.



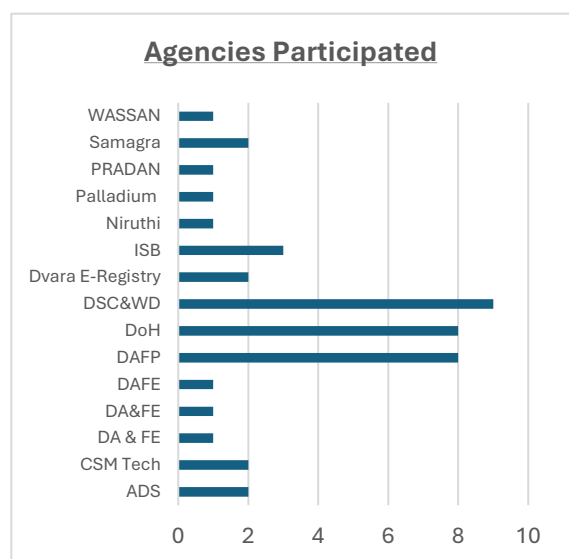
The age of participants ranged from 25 to 59 years, with an average age of approximately 32.3 years and a median age of 32 years, indicating a strong presence of early- to mid-career professionals in the training cohort.

A detailed analysis of the age distribution reveals that the majority of participants—21 individuals—belonged to the 30–39 age

group. This was followed by 17 participants in the 20–29 age bracket, highlighting a significant representation of young professionals. Additionally, four participants were in the 40–49 age range, and one participant was aged between 50 and 59 years. This age profile reflects the department's strategic investment in building long-term analytical capacity among its junior and mid-level workforce.

The training program drew participation from a diverse set of stakeholders across government departments, research institutions, and development organizations. A total of **15 distinct agencies** were represented, reflecting strong multi-sectoral engagement and collaboration.

The **Department of Soil Conservation & Watershed Development (DSC&WD)** led the participation with **9 officers**, followed closely by both the **Department of Agriculture and Farmers' Empowerment (DAFP)** and the **Department of Horticulture (DoH)**, contributing **8 participants each**. This demonstrates a high level of engagement from key government directorates responsible for driving agricultural transformation in the state.

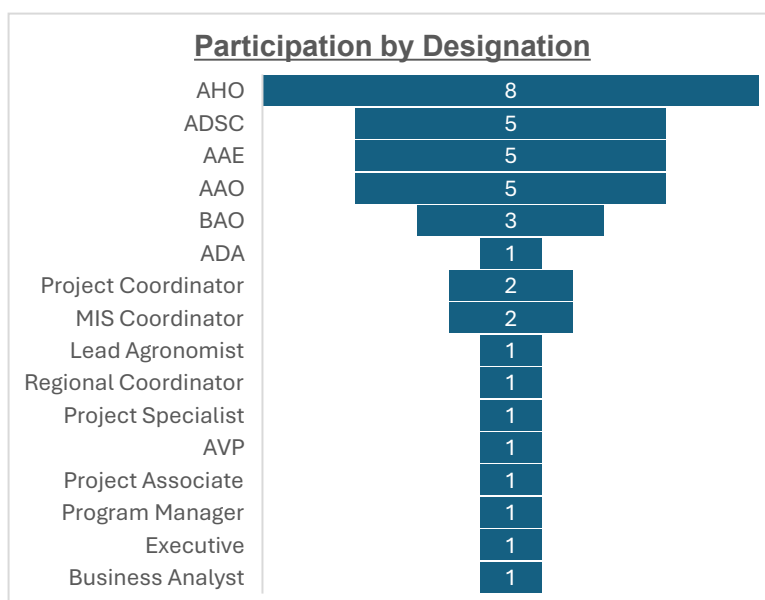


Other departments and organizations also made meaningful contributions:

- Indian School of Business (ISB): 3 participants
- Access Development Services (ADS), Dvara E-Registry, Samagra, and CSM Technologies: 2 participants each
- Directorate of Agriculture and Food Production (DA & FE/DA&FE) and DAFE: 1 participant each
- Niruthi, Palladium, PRADAN, and WASSAN: 1 participant each

This broad participation underscores the interdisciplinary and collaborative nature of the training, fostering stronger linkages between government institutions, academic bodies, and implementation partners working toward inclusive agricultural development.

The training program brought together participants from a wide range of designations, combining grassroots-level officers, mid-level functionaries, and domain specialists. A total of 16 unique designations were represented, underlining the training's inclusive and comprehensive design to build capacity across organizational hierarchies.



### Key Highlights:

- Assistant Horticulture Officers (AHO) made up the largest group with 8 participants, reflecting the importance of horticulture in the state's agricultural strategy.
- Assistant Director of Soil Conservation (ADSC), (ADSC), Assistant Agriculture Engineers (AAE), and Assistant Agriculture Officers (AAO) each had 5 participants, indicating balanced participation from both technical and administrative cadres.
- Mid-level officers such as Block Agriculture Officers (BAO) and Project Coordinators had notable presence.
- Specialist roles from project implementation and technical partners—such as MIS Coordinators, Lead Agronomist, Business Analyst, and Project Specialist—added a valuable multi-disciplinary perspective.

Such a diversity of designations ensures that the training outcomes can influence both policy execution and field implementation through well-coordinated institutional channels.

## Chapter 2 : Training Content, Methodology and Profile of Trainers

### Training Content

The training program was designed to build foundational and applied skills in data collection, management, analysis, and interpretation with an emphasis on both primary and secondary data sources. It adopted a hands-on, tool-based approach and was structured around the following key thematic modules:

#### 1. Designing Questionnaires for Primary Data Collection

Participants were introduced to the core principles of questionnaire design, with a focus on developing effective tools for capturing high-quality, structured data. The session also covered best practices in digital data collection.

#### 2. Practical Demonstration of Digital Data Collection using Kobo Toolbox

A hands-on group exercise enabled participants to experience real-time data collection using Kobo Toolbox, including form creation, deployment, and data retrieval using mobile devices.

#### 3. Introduction to Stata: Basics and Interface Navigation

This session provided participants with a grounding in **Stata**, a widely used software for statistical analysis, focusing on its interface, key functions, and command structure.

#### 4. Secondary Data Analysis in Stata and Excel

Participants learned techniques to clean, manage, and analyze secondary data using Stata and Excel, with demonstrations on importing datasets, conducting summary statistics, and basic interpretation.

#### 5. Group Exercise on Descriptive Analysis

A practical, collaborative session where participants performed descriptive statistical analysis using real datasets in Stata/Excel, reinforcing their understanding through applied learning.

#### 6. Exploring Other Secondary Datasets

This module exposed participants to various publicly available secondary data sources and taught methods to extract and utilize relevant data for agricultural policy and program assessment.

#### 7. Data Visualization Techniques in Stata and Excel

The session covered effective data visualization methods including charts, graphs, and tables to enhance communication of key findings.

#### 8. Preparation of Research Papers and Triangulation of Evidence

The final module focused on guiding participants through the process of research writing—including structuring a paper, presenting quantitative and qualitative evidence, and linking findings to policy implications.

Each module was designed to be interactive and application-oriented, enabling participants to build technical competence while also understanding the relevance of data in evidence-based policy formulation.

## **Methodology of Training**

The training program was delivered through a blended and interactive pedagogical approach designed to actively engage participants and reinforce learning through application. The methodology was carefully structured to combine conceptual clarity with hands-on experience, ensuring that participants not only understood the tools and techniques but also gained the ability to apply them in real-world contexts.

The following key methodologies were adopted:

- **Interactive Lectures**

The Subject experts facilitated concept-building sessions through structured presentations and open discussions. These sessions encouraged questions, peer learning, and dialogue-based exploration of ideas.

- **Audio-Visual Presentations**

The use of visual content, including demonstration videos and slideshows, helped simplify complex data processes and tools such as Kobo Toolbox and Stata, making technical content more accessible and engaging.

- **Exercises and Individual Assignments**

Participants were given practical tasks—both individually and in groups—to apply their learning in simulated real-world scenarios. These included designing survey forms, conducting descriptive analysis, and interpreting datasets.

- **Assessments and Feedback**

Informal assessments were conducted throughout the training to gauge comprehension. Structured feedback sessions allowed participants to reflect on their learning and provided trainers with insights to adapt delivery in real time.

This multifaceted approach helped participants internalize concepts, build confidence with tools, and translate knowledge into actionable skills. The emphasis on participation and practice was a key driver of the training's effectiveness.

## Profile of Trainers

- **Dr. Devesh Roy**

Dr. Roy is a Senior Research Fellow in the Development Strategies and Governance Unit at IFPRI, specializing in international trade, environment, firm-farm linkages, and food safety. His recent work includes research on the economics of animal disease outbreaks, food safety in developing countries. His prior research focused on food security in South Asia and contract farming in India. He holds a PhD in Economics from the University of Maryland and a master's degree from the Delhi School of Economics.



- **Dr. Mamata Pradhan**

Dr. Pradhan is a Senior Research Coordinator in IFPRI's South Asia Regional Office. She conducts applied research on food systems, nutrition, and agricultural transformation, particularly in South Asia. Her work focuses on understanding how food systems can become more inclusive and nutrition-sensitive. She holds a Ph.D. in International Development from the University of East Anglia, UK.



- **Mr. Sunil Saroj**

Sunil Saroj is a Senior Research Analyst with IFPRI's Development Strategies and Governance Unit. He works on agricultural policy, food security, and rural development. He has a master's degree in economics from Jawaharlal Nehru University, New Delhi, and extensive experience in monitoring and evaluation and applied policy research.



- **Ms. Vandana S. Vidhani**

Vandana Vidhani is a Research Analyst in IFPRI's Development Strategies and Governance Unit based in Bhubaneswar. Her work focuses on indicators of inclusive agricultural transformation. She holds a master's degree in economics with a specialization in Environment and Resource Economics from TERI School of Advanced Studies. Her past work includes research on agricultural procurement systems and sustainable mobility.



## Chapter 3 : Training Session-Wise Description

**Session 1:** Fundamentals on designing questionnaires for primary data collection and how to collect data digitally.

**Trainer:** Dr. Mamata Pradhan

*Methodology* Presentation & Open discussion

<i>Topic Details</i>	<p>The first session was designed to lay a solid foundation for understanding and conducting research. It began by introducing the fundamentals—exploring where, how, and what to research. Dr. Mamata discussed the concept and significance of research, its wide-ranging applications across disciplines, and the consequences of neglecting it. Special attention was given to how research can address pressing social issues, particularly in South Asian and ASEAN contexts.</p> <p>The session also covered the process of formulating a hypothesis and developing innovative and relevant research questions. The speaker outlined the key steps involved in the research process, highlighting essential components such as research methodology, including both quantitative and qualitative approaches. Through real-life case examples, she illustrated the process of crafting strong research questions.</p> <p>A key focus was placed on the FINER criteria—emphasizing that research questions should be Feasible, Interesting, Novel, Ethical, and Relevant. The speaker further elaborated on the growing importance of research in the context of the global knowledge economy, and underscored the value of positioning oneself as a researcher, especially when working in rural settings.</p>
<i>Key Learning Outcomes</i>	<ul style="list-style-type: none"> <li>• Understanding Research Fundamentals: Gained clarity on the basic concepts, importance, and application of research across various fields, with a focus on addressing social issues in South Asian and ASEAN contexts.</li> <li>• Formulating Research Questions: Learned how to develop innovative and relevant research questions using real-world examples, guided by the FINER criteria (Feasible, Interesting, Novel, Ethical, Relevant).</li> <li>• Research Methodology: Acquired knowledge of different research methodologies, including both quantitative and qualitative approaches, and the steps involved in conducting systematic research.</li> <li>• Positioning as a Researcher: Recognized the importance of establishing a research identity, particularly in rural and development-oriented settings, within the growing knowledge economy.</li> </ul>

**Session 2: Practical demonstration of data collection in Kobo Toolbox - Group Exercise****Trainer: Mr. Sunil Saroj***Methodology* Group Exercise / PPT

<i>Topic Details</i>	<p>The session provided participants with a hands-on introduction to Kobo Toolbox, a digital tool for data collection. It began with guiding participants to download and access the platform through <a href="https://kc.kobotoolbox.org">https://kc.kobotoolbox.org</a>. Mr. Saroj walked the participants through the initial steps of survey creation, including setting survey objectives, capturing informed consent, and collecting basic demographic details such as household geocoordinates.</p> <p>He emphasized the advantages of Kobo Toolbox in minimizing the challenges and errors associated with manual data collection. The session also introduced the <b>Open Data Kit (ODK)</b> platform, which supports the development of survey forms and is freely accessible. Mr. Saroj explained the basic features of ODK, highlighting its ability to capture timestamps and improve data accuracy. A detailed, step-by-step demonstration of using Kobo Toolbox was provided to enhance participants' practical understanding.</p>
<i>Key Learning Outcomes</i>	<ul style="list-style-type: none"> <li>• Digital Survey Skills: Gained hands-on experience in using Kobo Toolbox for efficient, real-time data collection.</li> <li>• Survey Design &amp; Consent: Understood the process of designing surveys—from defining objectives to capturing informed consent and demographic data.</li> <li>• ODK Integration: Learned the basics of the ODK platform for developing digital survey forms and enhancing data reliability.</li> <li>• Improved Data Accuracy: Recognized how tools like Kobo and ODK reduce manual effort, minimize errors, and capture critical metadata such as timestamps and geocoordinates.</li> </ul>

**Session 3: Fundamentals of Using Stata****Trainer: Mr. Sunil Saroj***Methodology* Presentation and exercise

<i>Topic Details</i>	<p>The session offered an in-depth orientation on the use of Stata, a powerful tool for statistical analysis and data management. The facilitator began by noting that, if there is sufficient demand, the Department of Agriculture and Farmers' Empowerment (DAFE) could consider providing a paid version of Stata to its staff to strengthen their analytical capabilities. Emphasizing its user-friendly design, he highlighted how Stata's commands are intuitive—often corresponding directly to the function name itself. For example, to modify values in a dataset, one simply uses the command <code>replace</code>, making it accessible even for beginners.</p> <p>Participants were introduced to essential Stata components such as do-files, which are used to write and save sequences of commands for consistent and repeatable analysis, and log files, which document the command history and outputs, enabling users to track past activities. The session also covered the use of the Data Editor and Data Browser, which allow users to view, edit, and explore data in a tabular format.</p>
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*Key Learning Outcomes*

The trainer demonstrated how Stata can import and export datasets in multiple formats—including CSV, SPSS, SAS, and Excel—enhancing its interoperability with other platforms. He discussed the different types of variables recognized by Stata, such as text, integer, byte, and string, and explained how the color-coded display (red, black, blue) helps users quickly interpret the nature and status of variables.

- **Familiarity with Stata Interface and Commands:** Understood the basic command syntax, user-friendly design, and structure of Stata, including do-files and log files for efficient use.
- **Data Handling Proficiency:** Learned how to import/export data in multiple formats and explore, edit, and browse datasets using Stata's interactive tools.
- **Variable Management:** Gained insights into types of variables and Stata's visual indicators to enhance data interpretation.
- **Practical Applications:** Applied Stata tools to real-world examples, such as identifying unique beneficiaries and tabulating data by categories like gender, while also learning to clean datasets by removing duplicates and outliers.

**Session 4/5:** Data Analysis and Practical Demonstration of Secondary Data with Group Exercise on Descriptive Analysis in Stata/Excel

**Trainer: Mr. Sunil Saroj**

*Methodology Presentation & Discussion*

*Topic Details*

In this highly interactive and hands-on session, Mr. Sunil Saroj guided participants through the fundamentals of data analysis using **Stata**, with a specific focus on cleaning and processing secondary datasets related to farmer enrolment and insurance in **Boudh district, Odisha**. Drawing on real-world data from **district-wise enrolment for Kharif-2022**, the session introduced participants to practical techniques for identifying and removing duplicate entries and outliers—critical for ensuring data integrity and accuracy. Using commands such as `duplicates`, `sort`, and `replace`, Mr. Saroj demonstrated how to distinguish between total records and unique farmers availing government schemes, highlighting the analytical power of Stata compared to traditional tools like Excel.

Participants were introduced to the Stata interface, including how to import Excel data, navigate the Data Editor, and work with log and Do files. They learned to visually explore datasets, differentiate between numeric, alphanumeric, and labeled variables through color coding, and perform basic descriptive analysis using commands like `describe`, `summarize`, `tabulate`, and `codebook`. Group exercises were conducted to reinforce learning, where participants practiced converting variables between string and numeric formats (`destring`, `tostring`), generating summary statistics (e.g., for age, area insured, and farmer share), and recoding categorical variables like gender using `label define`, `label values`, and `replace`. Participants also worked on text formatting using case conversion functions and created gender-wise and block-wise tabulations to understand data distribution. Through structured demonstrations and collaborative group tasks, the session built participants' confidence in performing foundational data management and descriptive

*Key Learning Outcomes*

analysis—laying the groundwork for more advanced analytical applications in both Stata and Excel.

- Efficiently import and explore secondary datasets in Stata, including identifying variable types and structures using the describe command.
- Apply key data cleaning techniques, such as identifying duplicates, converting variable formats, and standardizing text entries.
- Generate summary statistics and frequency distributions using commands like summarize and tabulate to derive initial insights.
- Recode and label variables for improved readability, including the creation and application of value labels to categorical data.
- Perform basic descriptive and cross-tabulation analysis to examine variable distributions across gender, block, and district categories.

### **Session 6/7:** Practical Demonstration on Exploring Other Secondary Datasets and Visualization of Data in Stata/Excel

**Trainer:** Mr. Sunil Saroj

*Methodology* Group exercise and Presentation

*Topic Details*

In an engaging session on “**Visualization of Data in Stata/Excel,**” Mr. Sunil Saroj demonstrated practical techniques for organizing and visualizing large datasets, particularly from the **Situation Assessment Survey**. The session began with data cleaning and structuring techniques, such as renaming variables for clarity (e.g., changing "residence" to "village\_Boudh") and using the recode command to classify continuous variables like age into categories for better visualization. He emphasized the importance of such classification in large agricultural datasets to enable comparison using percentages. The use of xtile for creating quantile groups (e.g., income quartiles), set seed and sample for generating reproducible random samples, and drop/keep commands for refining the dataset were explained with hands-on examples. Participants learned how these steps simplify the creation of visual outputs and improve the interpretability of findings.

Mr. Saroj further illustrated how commands like sum and sort aid in generating descriptive statistics and organizing data for visualization. The session also covered merging multiple datasets to enable integrated analysis of household, income, and land data. Complementing Stata, he demonstrated the use of Excel features such as pivot tables, bar and line charts, and conditional formatting to highlight patterns and outliers. The session provided a strong foundation in preparing data for visual storytelling, helping participants understand how to present complex agricultural data in accessible formats for analysis and decision-making.

*Key Learning Outcomes*

- Learn to organize and prepare large agricultural datasets for visualization using key Stata commands like rename, recode, xtile, drop, keep, and sample.
- Gain practical skills to summarize and categorize data (e.g., age groups, income quantiles) for clearer interpretation and comparison using percentages.

- Develop the ability to create effective visualizations in Stata and Excel, including the use of pivot tables, charts, and conditional formatting for policy-oriented insights.

## Session 8: Preparation of Research Paper and how to corroborate the findings with Qualitative and Quantitative Analysis

**Trainer: Dr. Devesh Roy**

*Methodology Presentation & Discussion*

<i>Topic Details</i>	<p>In this insightful session, Dr. Devesh provided participants with a comprehensive understanding of the foundations of research design, covering both qualitative and quantitative approaches, and highlighting key methodological concepts crucial for high-quality data collection and analysis. He emphasized that the formulation of research questions defines the boundaries of any study, shaping the choice of methods, tools, and interpretation frameworks. The session delved into how research questions can aim to measure effects, associations, or causality, and the methodological implications of each. Dr. Devesh illustrated the importance of semi-structured interviews in qualitative research and stressed that pretesting the questionnaire is critical—labeling the absence of this step as a "Gold-level mistake" in research design.</p> <p>Further, the session elaborated on a hierarchy of common research pitfalls: Gold-level mistakes (e.g., skipping pretests), Silver-level mistakes (e.g., having too many open-ended questions or missing rosters), and Bronze-level mistakes (e.g., minor data inconsistencies or rounding errors). According to Dr. Devesh, while classical errors such as random noise often cancel out in large samples, non-classical errors—like poor question framing or sampling bias—can severely distort results and must be minimized through careful design. He stressed that questionnaires should be tailored to the sample and written in the simplest, most straightforward language. Designing the optimal questionnaire length was discussed to ensure respondent engagement while collecting adequate information.</p> <p>A significant part of the session focused on sampling theory. Dr. Devesh explained that a sample should be representative of the population, and both sampling and non-sampling errors should be minimized. He discussed different sampling methods—random sampling, convenience sampling, and purposive sampling—and the importance of choosing the right technique based on research objectives. He introduced the concept of bias as the difference between the characteristics of the sample and those of the population, and emphasized the need to reduce such bias to improve the validity of findings. He explained the concept of sample variability, noting that lower variability leads to more reliable estimates. The sample size, he said, should be determined based on the variability in the population, population size, and the margin of error allowed. Dr. Devesh also highlighted the power of randomization as a key principle in experimental and observational studies to ensure fairness and objectivity in sampling.</p>
<i>Key Learning Outcomes</i>	<ul style="list-style-type: none"> <li>• Understand key elements of research design, including how well-formulated research questions shape methodology and analysis.</li> </ul>

- Identify common pitfalls in survey design, such as gold-, silver-, and bronze-level mistakes, and recognize the importance of pretesting questionnaires.
- Differentiate between classical and non-classical errors in data collection and learn strategies to minimize non-sampling errors.
- Gain knowledge of various sampling techniques (random, purposive, convenience) and understand how to select an appropriate method based on research goals.
- Calculate and interpret key sampling concepts such as bias, sample variability, and required sample size based on population characteristics and error margins.

## Chapter 4 : Participant Feedback on the Training

Feedback from the 41 participants was collected at the end of the training to assess the relevance, delivery, and applicability of the sessions. The responses reflect an overwhelmingly positive reception, with key highlights as follows:

### 1. Relevance and Scope of Training Content

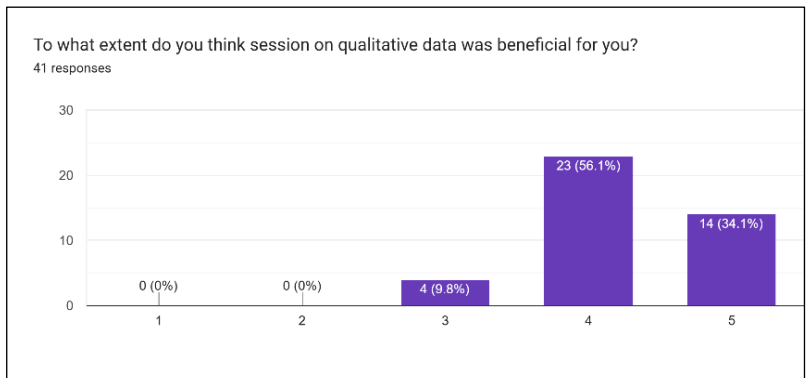
Participants found the material highly relevant and appropriately covered:

- Majority of the responses (31.7%) explicitly indicated that adequate was covered—reflecting the richness of content—while others provided varied but largely positive qualitative responses.
- This suggests the sessions were information-dense, and future editions may benefit from slight pacing adjustments without reducing the depth.



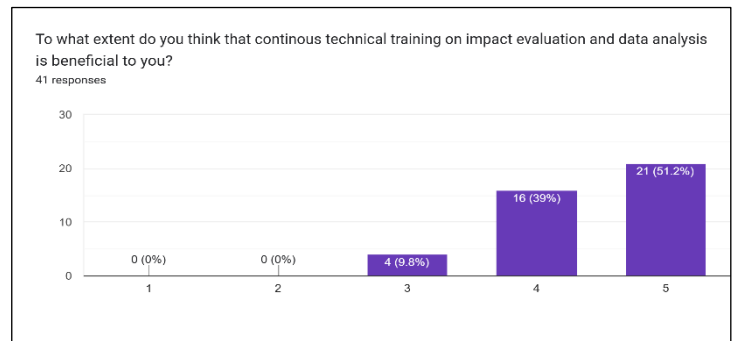
### 2. Usefulness of the Qualitative Data Session

- A total of 90.2% of participants rated the session 4/5 out of 5, confirming the high utility of the qualitative data component in enriching their analytical understanding.
- None of the participants rated it below 3.



### 3. Need for Continuous Technical Training

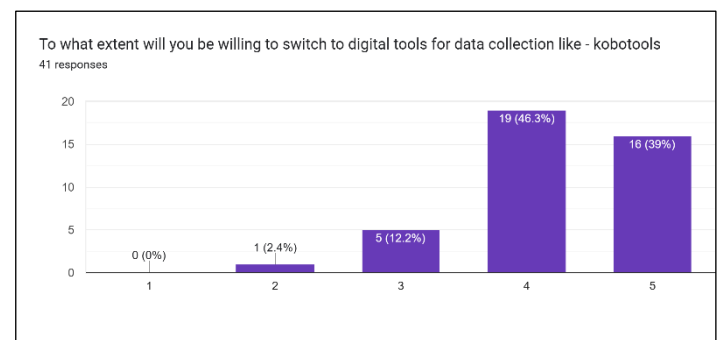
- 90.2% of participants rated the importance of continuous training in impact evaluation and data analysis at 4 or 5, with 51.2% giving the highest rating.
- This reflects a strong demand for ongoing capacity-building programs to deepen and sustain learning.



### 4. Willingness to Adopt Digital Tools like Kobo Toolbox

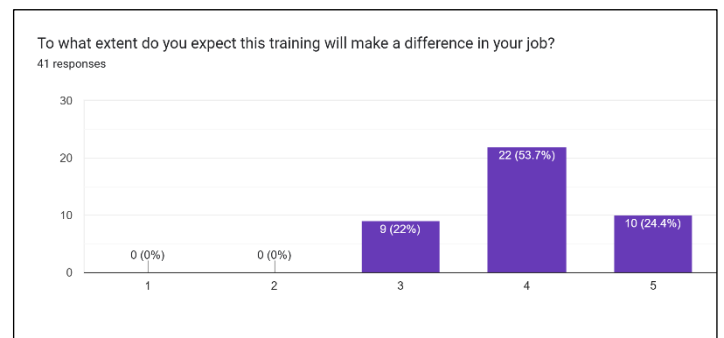
- A significant 85.4% rated their willingness at 4 or 5, indicating a strong openness to integrating digital tools in field operations.

This highlights a readiness for digital transformation in data collection practices.



### 5. Expected Impact on Job Performance

- Over 78% of participants rated 4 or 5 when asked whether the training would make a difference in their work.
- This shows confidence that the skills gained will translate into improved performance and data-driven decision-making.



## Chapter 5 : Key Outcomes and Takeaways

### Key Outcomes from the Training

The training program achieved several important outcomes, both in terms of knowledge enhancement and practical skills development:

- **Enhanced Technical Competence:** Participants gained hands-on experience in questionnaire design, digital data collection (Kobo Toolbox), and data analysis using Stata and Excel—including descriptive statistics, secondary data handling, and data visualization.
- **Application-Oriented Learning:** Group exercises and practical demonstrations allowed participants to apply techniques in realistic contexts, reinforcing learning beyond theoretical understanding.
- **Positive Impact on Job Relevance:** More than 78% of participants reported that the training is likely to make a tangible difference in their day-to-day responsibilities.
- **Digital Readiness:** A significant, 85.4% of participants expressed willingness to adopt digital tools like Kobo Toolbox for field-level data collection.
- **Strong Multi-Stakeholder Engagement:** Participation from 15 diverse agencies, including core government directorates, academic institutions, and NGOs, promoted inter-sectoral learning and collaboration.

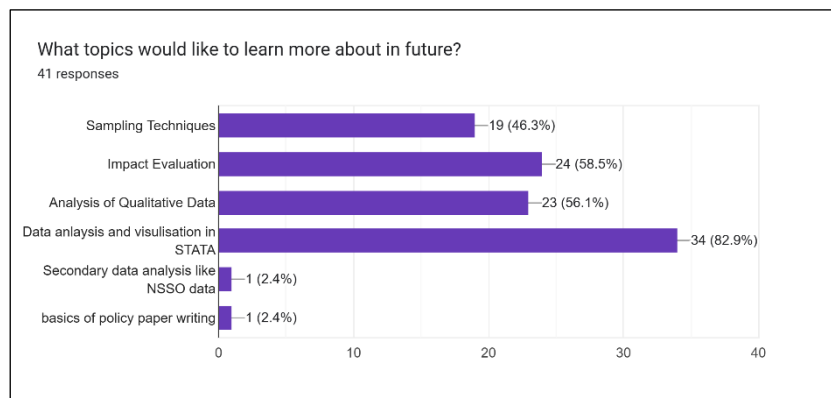
### Key Takeaways from the Training

The training not only addressed current skill gaps but also revealed areas of interest for future engagement:

- **High Demand for Advanced Training in Stata:** With 82.9% of participants expressing interest in further training on data analysis and visualization in Stata, there is a strong case for more advanced modules.
- **Broader Learning Needs Identified:** Other key areas participants want to explore include impact evaluation (58.5%), qualitative data analysis (56.1%), and sampling techniques (46.3%).
- **Foundation for Continued Capacity Building:** The training has set the stage for a long-term, structured learning journey tailored to junior and mid-level professionals driving data-related work in the agriculture and development sectors.
- **Reinforced Value of Practical Training:** Participant feedback underscored the effectiveness of interactive, tool-based sessions over purely lecture-driven formats.

In summary, the training laid a strong foundation for data-driven decision-making and revealed a clear roadmap for future technical sessions tailored to the analytical needs of junior and mid-level professionals in the agriculture and development sectors.

The feedback clearly indicates a strong appetite among participants for continued learning and deeper engagement with data and evaluation tools. The following themes emerged as priority areas for future capacity-building initiatives:



- **Data Analysis and Visualization in Stata (82.9%)**  
This was the most requested area, with 34 out of 41 participants expressing interest. This reflects the high relevance and applicability of Stata in their day-to-day work and suggests a need for more advanced, hands-on training modules.
- **Impact Evaluation (58.5%)**  
With 24 participants seeking further training in this area, there is evident interest in understanding how to assess and measure program effectiveness using rigorous methods.
- **Analysis of Qualitative Data (56.1%)**  
A total of 23 respondents indicated they would like to enhance their ability to interpret and integrate qualitative insights into broader data analysis frameworks.
- **Sampling Techniques (46.3%)**  
19 participants want to strengthen their foundational understanding of sampling methods—crucial for designing robust surveys and evaluations.
- **Other Areas**  
A few participants also expressed interest in niche topics such as:

  - Secondary Data Analysis using NSSO data (2.4%)
  - Basics of Policy Paper Writing (2.4%)

This feedback highlights a strong demand for practical, tool-based, and evaluation-oriented training modules, and can be used to shape the agenda for upcoming training sessions under ongoing capacity development programs.

## Chapter 6 : Valedictory Session

The Capacity Strengthening Training on Data Interpretation and Economic Outcome Analysis (Phase II) concluded with a valedictory session that brought together key officials, participants, and trainers to formally mark the closure of this critical learning initiative. The session was graced by the presence of Sri Shubhranshu Mishra alongside Dr. Sangram Keshari Pattanaik and Shri Nagendra Kumar Malik.

The valedictory session served as an important moment of reflection—highlighting not only the insights gained and technical skills developed during the training, but also the strategic vision behind this capacity-building initiative. Senior leadership from DAFE reiterated the department's commitment to strengthening the analytical capabilities of its field officers and fostering a culture of data-driven decision-making across the agriculture sector in Odisha.

In his address, Sri Shubhranshu Mishra commended the dedication and participation of the officers and emphasized the critical role that data interpretation and outcome analysis play in effective program design, monitoring, and policy formulation. He urged participants to integrate the tools and approaches learned during the training into their day-to-day responsibilities—bridging the gap between field-level observations and strategic planning to benefit farmers, especially smallholders.

The dignitaries acknowledged that Phase II of the training program built on the foundational learnings of Phase I, taking a deeper dive into interpreting real-world agricultural data and assessing economic outcomes with greater precision. Their remarks underscored the importance of institutionalizing such capacity-building efforts to ensure long-term impact and sustainability.

A key highlight of the session was the distribution of certificates to all successful participants, symbolizing their successful completion of Phase II of the training program. This moment recognized their commitment to professional growth and their readiness to apply newly acquired competencies in the field. As the training drew to a close, participants expressed a renewed sense of confidence and clarity in applying analytical frameworks to address practical challenges in agriculture. The session concluded on a hopeful and motivating note, with a collective commitment to contribute meaningfully to Odisha's inclusive and resilient agricultural transformation.



*Sri Shubhranshu Mishra being felicitated*



*Certificate distribution to the trainees*

## Annexure – I

## Event Agenda

Day	Time	Session	Details	Resource Persons
Day 1	9:30 AM – 10:00 AM	Inaugural Session	Welcome Address- Purpose of Training Keynote Speech and introduction of the participants	IFPRI
			Inauguration and Keynote address	DAFE
Day 1	10:00 AM - 11:00 AM	Session 1: Fundamentals on designing questionnaires for primary data collection and how to collect data digitally	<ul style="list-style-type: none"> <li>Basics of designing effective, unbiased questionnaires for field surveys.</li> <li>Introduction to digital data collection using Kobo Toolbox, including form creation and deployment.</li> <li>Best practices for ensuring data accuracy and respondent engagement.</li> </ul>	Dr. Devesh Roy, Senior Research Fellow, IFPRI
Day 1	11:00 AM – 11:15 AM	Tea Break		
Day 1	11:15 AM – 1:00 PM	Session 2: Practical demonstration of data collection in Kobo Tools	<ul style="list-style-type: none"> <li>Participants to create and deploy digital forms using <b>KoboToolbox</b>.</li> <li>Group exercise simulating field data collection on mobile devices.</li> <li>Demonstration of Real-time data submission, monitoring, and basic troubleshooting.</li> </ul>	Sunil Saroj, Senior Research Analyst, IFPRI &
Day 1	1:00 PM – 2:00 PM	Lunch Break		
Day 1	2:00 PM – 3:30 PM	Session 3: Fundamentals of Using Stata	<ul style="list-style-type: none"> <li>Introduction of Stata interface, basic commands, and data file formats.</li> <li>Demonstration of importing, browsing, and managing datasets.</li> <li>Essential operations like generating variables and summary statistics.</li> </ul>	Sunil Saroj, Senior Research Analyst, IFPRI &
Day 1	3:30 PM – 4:00 PM	Tea Break		

Day 1	4:00 PM – 5:30 PM	Session 4: Data Analysis and Practical Demonstration of Secondary Data in Stata/Excel	<ul style="list-style-type: none"> <li>• Demonstration of cleaning, organizing, and exploring secondary datasets in <b>Stata</b> and <b>Excel</b>.</li> <li>• Key descriptive statistics, filtering, and data transformation techniques.</li> <li>• Interpretation of outputs for policy-relevant insights.</li> </ul>	Sunil Saroj, Senior Research Analyst, IFPRI &
Day 2	9:30 AM – 10:30 AM	Session 5: Group Exercise on Descriptive Analysis in Stata/Excel	<ul style="list-style-type: none"> <li>• Hands-on descriptive analysis using real datasets in <b>Stata</b> and <b>Excel</b>.</li> <li>• Generating summary statistics, cross-tabulations, and data visualization.</li> <li>• Group-based interpretation and presentation of findings.</li> </ul>	Dr. Mamata Pradhan, Research Coordinator, IFPRI
Day 2	10:30 AM – 11:00 AM	Tea Break		
Day 2	11:00 AM – 1:00 PM	Session 6: Practical Demonstration on Exploring Other Secondary Datasets	<ul style="list-style-type: none"> <li>• Introduction to key public data sources relevant to agriculture and rural development.</li> <li>• Demonstration of methods to access, extract, and prepare datasets for analysis.</li> <li>• Discussion on data relevance, limitations, and integration into policy research.</li> </ul>	
Day 2	1:00 PM – 2:00 PM	Lunch Break		
Day 2	2:00 PM – 3:30 PM	Session 7: Visualization of data in Stata/Excel	<ul style="list-style-type: none"> <li>• Demonstration of creation of charts, graphs, and tables using <b>Stata</b> and <b>Excel</b>.</li> <li>• How to choose appropriate visuals for different data types and audiences.</li> <li>• Best practices for clear, impactful data presentation.</li> </ul>	
Day 2	3:30 PM – 4:00 PM	Tea Break	<ul style="list-style-type: none"> <li>• Structure and key components of a research paper (abstract, methods, results, discussion).</li> <li>• Demonstration of how to integrate qualitative insights with quantitative data for stronger evidence.</li> <li>• Clarity, coherence, and policy relevance in presenting findings.</li> </ul>	
Day 2	4:00 PM – 5:30 PM	Session 8: Preparation of Research Paper and How to Corroborate the Findings with Qualitative and	<ul style="list-style-type: none"> <li>• Structure and writing process of a research paper with a focus on clarity and relevance.</li> </ul>	Dr. Mamata Pradhan, Research Coordinator, IFPRI & Dr.

		Quantitative Analysis	<ul style="list-style-type: none"><li>• Demonstration methods to integrate quantitative data with qualitative insights for robust analysis.</li><li>• Techniques to triangulate findings and strengthen evidence-based conclusions.</li></ul>	Devesh Roy, Senior Research Fellow, IFPRI
Day 2		Closing Remarks and Valedictory	<ul style="list-style-type: none"><li>• Reflections on key learnings, participant experiences, and overall training outcomes.</li><li>• Closing remarks by DAFE Officials</li><li>• Certificates distribution.</li></ul>	DAFE

## Annexure – II

## Participants List

Sl. No.	Name of Officials	Gender	Designation	Directorate	District
1	Prajnadutta Priyadarshini	Female	AAO	DAFP	Khordha
2	Jagruti Nanda	Female	AAO	DAFP	Puri
3	Ramya Ranjan Mohanta	Male	AAO	DAFP	Mayurbhanj
4	Nehalin Bhuyan	Female	AAO	DAFP	Balangir
5	Chinmoyee Naik	Female	AAO	DAFP	Angul
6	Lenien Sabar	Male	AAO	DAFP	Koraput
7	Ganeswar Sahu	Male	BAO	DAFP	Ganjam
8	Deepak Kumar Bhoi	Male	AAO	DAFP	Sundergarh
9	Tilottama Mahakuda	Female	ADA, Soil Chemist	DAFP	Bhadrak
10	Saswat Kumar Mishra	Male	AAO	DAFP	Deogarh
11	Prabodha Kumar Biswal	Male	BAO	DAFP	Keonjhar
12	Lalatendu Mohapatra	Male	ADA	DAFP	Bhubaneswar
13	Sudhansu Shekhar Sahu	Male	ADA	DAFP	Bhubaneswar
14	Namrita Khadia	Female	ADAPT Officer	DSC & WD	Angul
15	Adyasha Mallick	Female	ADAPT Officer	DSC & WD	Boudh
16	Anuradha Behera	Female	ADAPT Officer	DSC & WD	Dhenkanal
17	Niharika Sahoo	Female	ADAPT Officer	DSC & WD	Kendrapara
18	G Mansi Mohapatra	Female	ADAPT Officer	DSC & WD	Khurdha
19	Birabhadra Rout	Male	ADAPT Officer	DSC & WD	Nayagarh
20	Siba Prasad Nayak	Male	ADAPT Officer	DSC & WD	Bhubaneswar
21	Ankita Mishra	Female	ADSC	DSC & WD	Bhubaneswar
22	Tirjyak Kumar Das	Male	AHO	DOH	Balangir
23	Manorama Mukut	Female	AHO	DOH	Dhenkanal
24	Krushna Chandra Mohanty	Male	AHO	DOH	Nabarangpur
25	Aruna Rani Oram	Female	AHO	DOH	Keonjhar
26	Monalisha Kispotta	Female	AHO	DOH	Sundergarh
27	Aiswariya Panda	Female	AHO	DOH	Ganjam
28	Tanmay Chhualsingh	Male	AHO	DOH	Rayagada
29	Priyanka Priyadarshini Rout	Female	AHO	DOH	Bhubaneswar
30	Pralipta Pani	Female	AAE	DOH	Bhubaneswar
31	Jitendra Mallick	Male	AVP	Access Development Services	Nabarangpur
32	Preeti Padma Pradhan	Female	MIS Coordinator	Access Development Services	Bhubaneswar
33	Naveen Sharma	Male	Lead Agronomist	Dvara E-Registry	Bhubaneswar

<b>34</b>	Abhijeet Parida	Male	Senior Business Analyst	Dvara E-Registry	Bhubaneswar
<b>35</b>	Prajnya Praharaj	Female	Project Associate - Communications	Palladium Consulting India Pvt. Ltd.	Bhubaneswar
<b>36</b>	Darshith S	Male	MIS Expert	Samagra	Bhubaneswar
<b>37</b>	Abhimanyu Timbadia	Male	MIS Expert	Samagra	Bhubaneswar
<b>38</b>	Baburam Patra	Male	Executive	PRADAN	Bhubaneswar
<b>39</b>	Pranabandhu Nayak	Male	Project Specialist	Indian School of Business	Bhubaneswar
<b>40</b>	Satyajit Nayak	Male	Project Coordinator	Indian School of Business	Bhubaneswar
<b>41</b>	Santosh Behera	Male	Project Coordinator	Indian School of Business	Bhubaneswar
<b>42</b>	Prasanta Kumar Sethy	Male	MIS Expert	CSM Technologies	Bhubaneswar
<b>43</b>	Somesh Rout	Male	MIS Expert	CSM Technologies	Bhubaneswar
<b>44</b>	Aditi Biswas	Female	Program Manager	Niruthi	Bhubaneswar

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