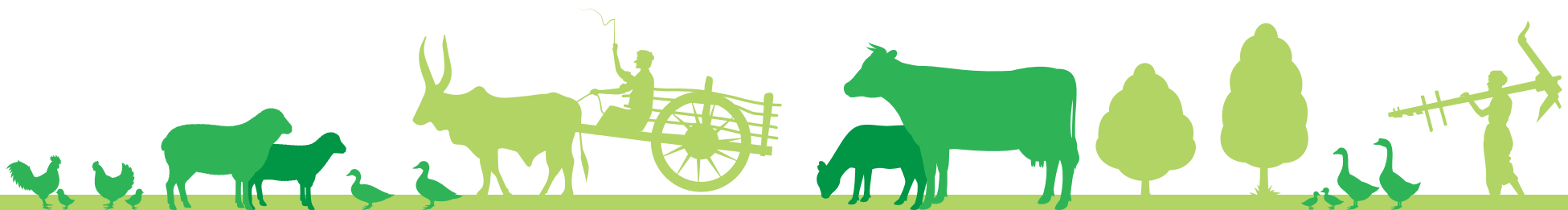


# “VISIONAIRY: THE GLOBAL INTELLIGENCE ENGINE FOR A UNIFIED & SUSTAINABLE FUTURE”

EDITION:  
ANIMAL HUSBANDRY - MAY 2025

FOR ANDHRA PRADESH, INDIA | EMPOWERING 170+ COUNTRIES GLOBALLY  
BRIDGING GAPS | LEVERAGING AI | ENABLING ESG | ZERO POVERTY |  
IGNITING ENTREPRENEURSHIP | SMART MONITORING | RTGS



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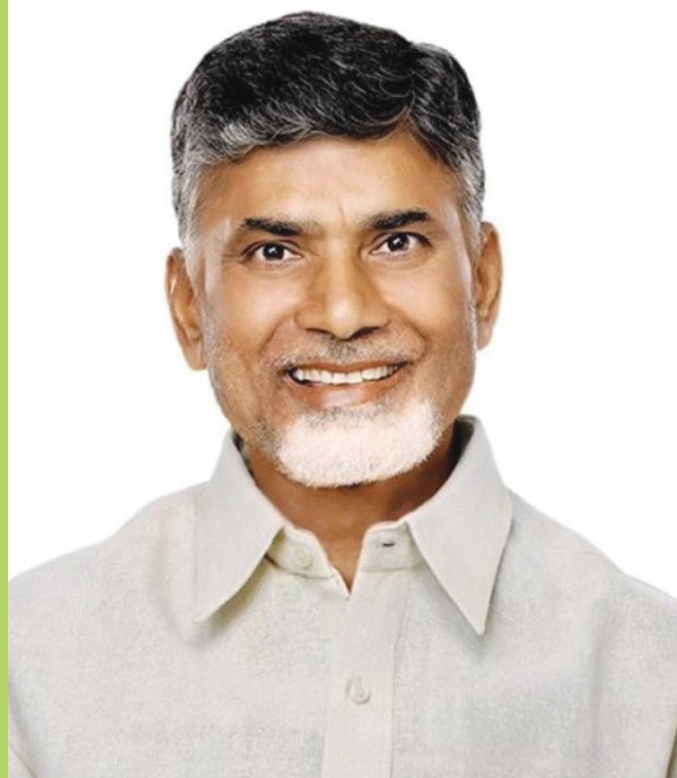
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The interactive dashboard are reserved in-house by GFST AI-Ops & AI-Analytics Team



## CHIEF PATRON'S MESSAGE

Pioneering Livestock-Led Prosperity Andhra Pradesh is spearheading an agrarian revolution by harnessing technology, entrepreneurship, and Agri-Tech startups to transform livestock farming. Through Public-Private-People Partnerships (P4), the state is addressing critical gaps in animal healthcare, breeding, and market access, promote elite calf rearing, and fodder development, accelerating progress towards Swarna Andhra Pradesh @ 2047.

“

**AT THE END OF THE DAY, POLICY &  
POLITICS ARE MEANT TO DO GOOD  
TO THE SOCIETY.**

”

**Shri N. Chandra Babu Naidu**  
Chief Patron

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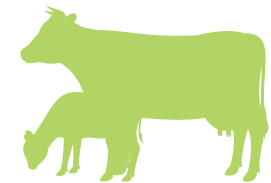


# 1. INTRODUCTION TO GFST' AI SHEPHERD: GUIDING ANIMAL HUSBANDRY INTO THE DIGITAL AGE

TRANSFORMING ANDHRA PRADESH'S ANIMAL HUSBANDRY (LIVESTOCK) WITH  
ARTIFICIAL INTELLIGENCE

**EDITION:** ANIMAL HUSBANDRY - MAY 2025

## 1.1 Leveraging Artificial Intelligence for Sustainable Growth in Andhra Pradesh's Animal Husbandry Sector.



The animal husbandry sector is a cornerstone of Andhra Pradesh's economy, supporting numerous livelihoods and contributing significantly to the state's food security. However, the sector faces persistent challenges in optimizing productivity, managing animal health, and ensuring efficient operations. The advent of Artificial Intelligence (AI) and related DeepTech offers unprecedented opportunities to address these complexities through

data-driven insights and intelligent automation. This document presents a comprehensive overview of an AI-powered initiative designed to revolutionize animal husbandry in Andhra Pradesh, drawing upon advanced data management, sophisticated analytics, and real-time monitoring capabilities. This report, titled **"Animal Husbandry - May 2025,"** details the proposed framework and its potential to drive significant advancements across the sector.





## 2. EXECUTIVE SUMMARY: AN AI-DRIVEN ECOSYSTEM FOR ENHANCED EFFICIENCY AND SUSTAINABILITY

This initiative introduces a cutting-edge AI-based solution aimed at transforming animal husbandry practices in Andhra Pradesh. By integrating Artificial Intelligence and Machine Learning (AI/ML), the solution optimizes data management, streamlines Standard Operating Procedures (SOPs), and enhances business operations. Intelligent data management forms the core, enabling data-driven decision-making. AI-powered SOP optimization increases efficiency and compliance. Predictive analytics, leveraging AI/ML, forecasts demand, optimizes resource allocation, and proactively manages risks such as disease outbreaks and breeding program optimization. A real-time dashboard provides immediate insights into key performance indicators.

DeepTech innovations, including wearable sensors for livestock health monitoring and blockchain for supply chain transparency, are integral components. This initiative is tailored to Andhra Pradesh, utilizing data from the 2019 and 2024 Animal Husbandry Census. The integration of diverse data sources and advanced AI capabilities promises significant benefits for farmers, livestock, and the broader ecosystem, fostering improved productivity, animal health, supply chain transparency, and sustainable development. This initiative represents a significant step towards leveraging AI to achieve new levels of excellence in Andhra Pradesh's animal husbandry sector.



### 3. OVERVIEW OF ANIMAL HUSBANDRY 2019 & 2024 CENSUS AND STATISTICS FOR ANDHRA PRADESH

The animal husbandry sector in Andhra Pradesh has experienced considerable changes, as highlighted by the 20th Livestock Census in 2019 and the ongoing 21st Livestock Census in 2024-25. The 20th Livestock Census in 2019 recorded a total livestock population of 34.0 million in Andhra Pradesh, a significant 15.79% increase from the 29.4 million recorded in 2012. This growth rate was notably higher than the national average of 4.6% during the same period.<sup>1</sup> While the sheep population saw a remarkable surge, the populations of cattle, buffalo, goat, and pigs witnessed a decline. The poultry population also experienced substantial growth, increasing by 33.85% between 2012 and 2019. These shifts emphasize the dynamic nature of the sector and the necessity for data-driven solutions.

The 21st All India National Livestock Census - 2024 commenced in Andhra Pradesh in October 2024, with data collection continuing until February 2025. This census marks a significant advancement as it is the first to utilize a digital online Android application for data recording. This move towards digitalization promises more granular and timely data, crucial for refining AI/ML models to provide accurate and actionable insights for the animal husbandry sector in Andhra Pradesh. The census will document various livestock (animals), offering a thorough understanding of the state's animal resources and trends.





## LIVESTOCK: ECONOMIC CONTRIBUTIONS

The livestock sector's economic contribution is significant, with a national Compound Annual Growth Rate (CAGR) of 7.67% between 2014-15 and 2021-22. The sector's share in the Gross Value Added (GVA) of the Agriculture & Allied sector has risen from 24.32% in 2014-15 to 30.47% in 2021-22. Andhra Pradesh holds a leading position in India's livestock production, being the top egg-producing state and ranking among the highest in milk and meat production in 2018-19. The state's milk production reached 15.044 million tonnes in 2018-19, and meat production was 8.03 lakh MTs. This robust performance underscores the potential for AI-driven solutions to further enhance the sector's growth and efficiency.





## 4. APPROACH METHODOLOGY: INTELLIGENT DATA MANAGEMENT AND PREDICTIVE ANALYTICS

Our methodology centers on intelligent data management, AI-driven SOP optimization, and predictive analytics to enhance animal husbandry in Andhra Pradesh. We establish secure cloud platforms and data lakes for efficient data collection, storage, and processing. Data quality and standardization are paramount for reliable AI model insights. Integrating census data, real-time sensor readings, market trends, and disease surveillance creates a comprehensive sector view.

AI is utilized to optimize Standard Operating Procedures (SOPs) by analyzing existing workflows, identifying inefficiencies, and automating processes. AI-powered platforms facilitate SOP creation, review, and updates, ensuring standardized best practices. This optimization aims to improve operational efficiency, minimize errors, and ensure regulatory compliance. Examples of AI in SOP optimization include automating data entry, report generation, and ensuring adherence to evolving compliance standards.

Predictive analytics, driven by advanced AI/ML algorithms, streamlines business operations. This includes accurate demand forecasting, optimized resource allocation, and proactive risk management, particularly in predicting disease outbreaks. AI/ML also enhances breeding programs by analyzing genetic data and performance metrics. This approach provides stakeholders with valuable foresight for proactive decision-making, improved productivity, and optimized resource utilization across the animal husbandry value chain. AI and ML methodologies are increasingly being applied in agriculture and animal husbandry for tasks such as yield prediction, disease detection, precision livestock farming, and resource management.

### TOTAL SURVEYED MEMBERS

**101,657**

### ENTREPRENEURS

**43,763** (ACTIVE & WILLING)

### ACTIVITY

**AGRICULTURE 35%**

**LIVESTOCK 35%**

**OTHERS 30%**

### GENDER SPLIT RATIO

**46 (F) : 54(M)**





## 4.1 BUSINESS OPERATIONS: PROJECT METHODOLOGY



Our Project methodology is Agile with defined scrum goals is the project execution methodology from Project Kick-off till the inception of the Operations & Maintenance (O&M) phase (only if applicable) considering official closure and handover.

**PROGRAM Setup:** The program kick-off meeting is scheduled internally with respective Departments of State or Central Govt. or International Governing bodies or their representative stakeholders with GFST, to identify key areas, use cases and problem statements of the program unit.

**PROJECT KICK-OFF:** Then a project management unit (PMU) is designed, project schedule and immediate next steps, such as workshop and data gathering, are discussed and planned with necessary stakeholders and roles assigned.

**WORKSHOP & DATA GATHERING:** The workshop is conducted by the GFST team to agree the detailed requirements with the customer busi-

ness and project teams. The workshop helps the customer project team members to visualize the solution based on the demo version of the product. The workshop and demo helps in effective requirements and data gathering. The requirements discussed and agreed during the previous step are now analysed in detail and any necessary sample data and documents are collected. The outcome of the workshop is the Data Research and Exploration and design of outcomes for problem statement(s) that are signed by both parties.

**DEVELOPMENT, CUSTOMISATION AND PROCUREMENT:** This is an offshore activity or remote development or customization or integration (with GFST) during which all necessary customizations and interfaces are developed, configured, integrated, tested and released by the GFST Team and its Technical partners supporting engineering with applicable commercials for Man-hours, licensing for components or tools and technologies. During



## BUSINESS OPERATIONS: PROJECT METHODOLOGY

this phase the client is expected to ensure site or hardware or infra readiness is completed in terms of hardware build, third party software installation, dependencies, data feeds ready and personnel (SPOC) availability.

**INSTALLATION:** Release to be pre-installed and configured in the customer environment ensuring this is completed remotely before GFST Team arrives for handover. Functional testing of the installed solution is conducted using live data and any identified issues are passed back for resolution with Knowledge Transfer. The system deployment is now fine-tuned and system performance optimized during this activity.

**TRAINING:** GFST Trainer usually conducts the training program for the customer end-users and IT administrators after successful completion via Online or at GFST Premises with other paid programs with e-Learning partners like NorthCARD (NCARD).

**UAT:** User Acceptance Testing (UAT) is conducted by all stakeholders with test cases applicable and presentation of overall PMU Tasks for closure.

**GO LIVE:** The team configures the production system for production launch after successful completion of UAT and the client engineering or IT team monitors the system in the production environment post go live there after

**CLOSURE:** The PMU is handed over the system and the GFST team officially closes the project and handover with necessary runbooks, business and technical collaterals.



## 5. DESIGN OVERVIEW: AN INTEGRATED AI ECOSYSTEM

Our solution comprises an end-to-end AI ecosystem tailored for Andhra Pradesh's animal husbandry sector. The Data Ingestion and Processing module securely collects and refines data from various sources, including census records and sensor data. The Predictive Analytics Engine uses AI/ML to forecast disease outbreaks and optimize breeding.

The SOP Optimization analyzes and improves operational procedures leveraging knowledge base for model to understand key patterns, rules and specifics, etc.

The Real-Time Dashboard visualizes key performance indicators for timely decision-making. This ecosystem addresses low productivity through optimized recommendations and combats disease prevalence with predictive capabilities. It also streamlines supply chains and empowers farmers with user-friendly tools, aligning with the Government of Andhra Pradesh's focus on agricultural development.

### What it is

Infrastructure base for hosting  
(Cloud or On-Premises)

Data Lake and Data source

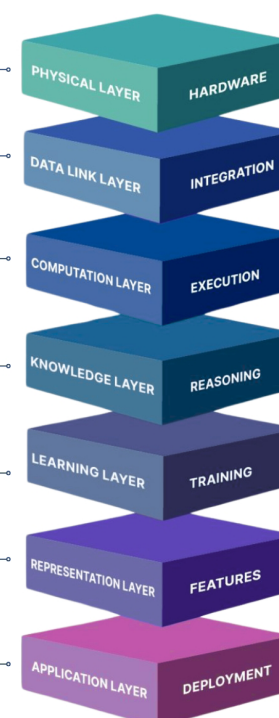
AI Suite for Real-Time logic  
computation (ML,NLP,CV)

Vector DB or RAG or  
Structured DB

Model Re-training and  
Sampling Techniques

Tokenization or Embedding

User Interface



### How it is

vCPU, GPU, TPU for fast  
processing and Storage

Historical Data and ETL  
Pipelines (Eg. PostgreSQL,  
Fast API)

Real-Time Computational  
based execution for historic  
data

Embedding and Knowledge  
base for AI

Pattern identification,  
Labelled and Unlabelled data  
training

Converting images to text or  
numbers etc.

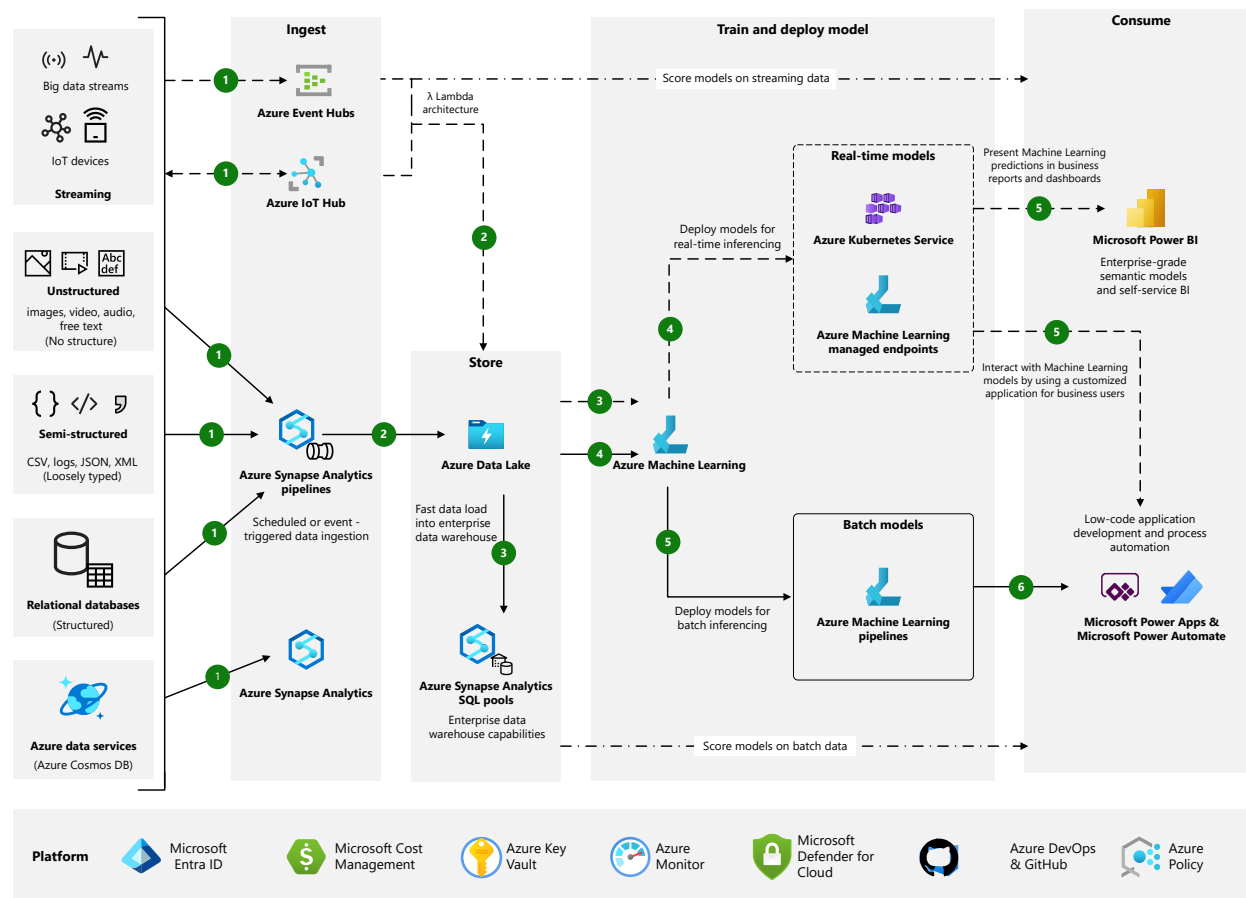
HTTPS Protocol based AI/BI  
Application UI





## 5.1 AI TOOLKIT

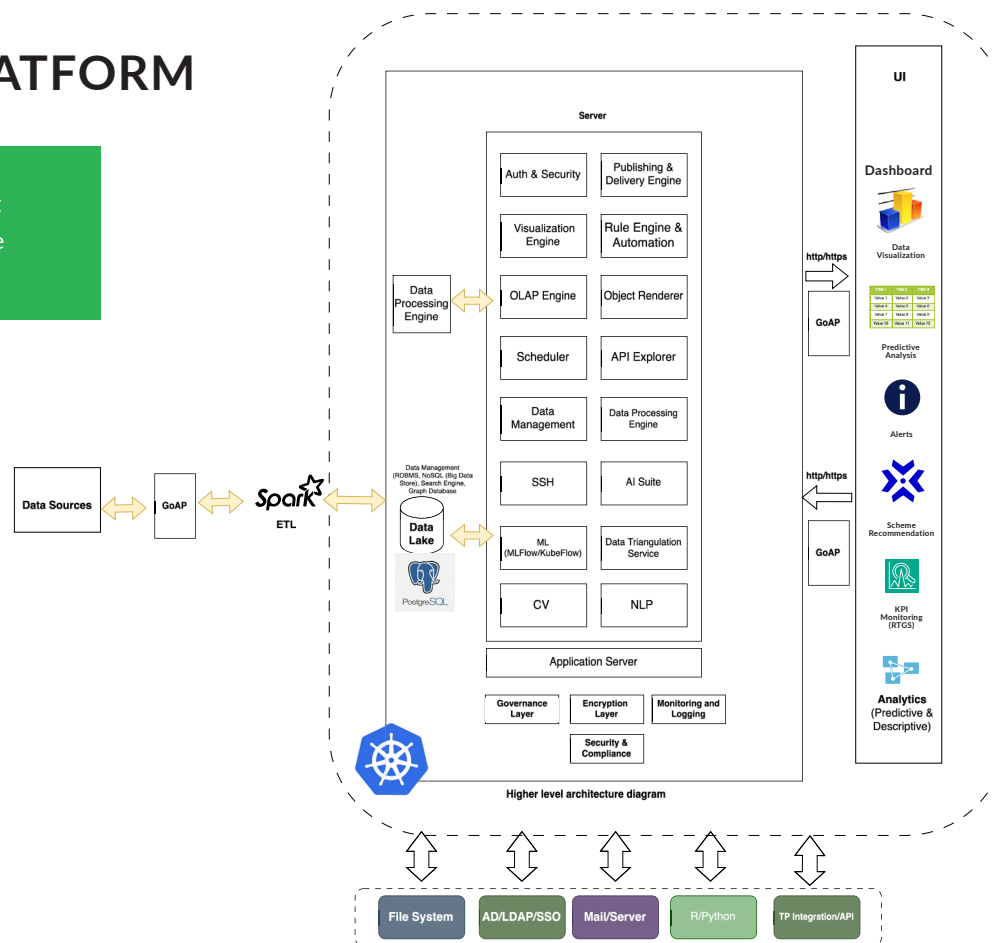
### SAMPLE HIGH-LEVEL ARCHITECTURE



Source: <https://www.linkedin.com/pulse/building-evolving-blue-print-technical-architecture-ai-powered-enoh-dlrv>

## 6. DESIGN ARCHITECTURE: A SCALABLE AND SECURE PLATFORM

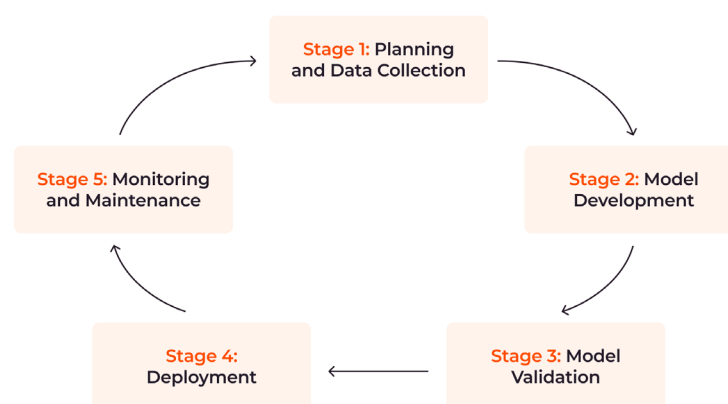
Our holistic and sector-agnostic AI solution is built on a robust and scalable technological foundation. The system architecture includes:



Data from sources like the Livestock Census and sensor data undergoes Data Ingestion followed by Data Cleaning & Transformation to ensure quality.



The AI/ML Engine performs Predictive Analytics and SOP Optimization.



Insights are presented via the Real-Time Dashboard. Secure data storage and GPU power for efficient processing are prioritized.

AI plays a crucial role in data management in animal husbandry by enabling automated data collection, analysis, and integration with farm management systems.

*Note: Commercials applicable for development and integrations with T&M or license or both as needed.*

This data is stored securely or synced with cron jobs in Data Storage or Data Lake (eg. PostgreSQL Data Lake) leveraging Licensed Enterprise Open-Source Version as applicable:

- **Transactional DB/ DataLake (RDBMS):** PostgreSQL / MySQL (for structured data)
- **NoSQL (Big Data Store):** Apache Cassandra (for large-scale citizen data) - Provided via DataStax
- **Search Engine:** Elasticsearch (for fast lookup & text search)- Provided via Elastic Enterprise
- **Graph Database:** Neo4j (for Family Tree & Relationships)

## ADD-ONS

1. IAM & Authentication: Keycloak/Okta (with SAML/OAuth2)
2. Data Encryption: AES-256 for sensitive citizen data
3. Web Application Firewall (WAF) for API protection
4. DDoS Protection: Cloudflare/AWS Shield
5. Audit Logging & Compliance: SIEM (Splunk/Sumo Logic)

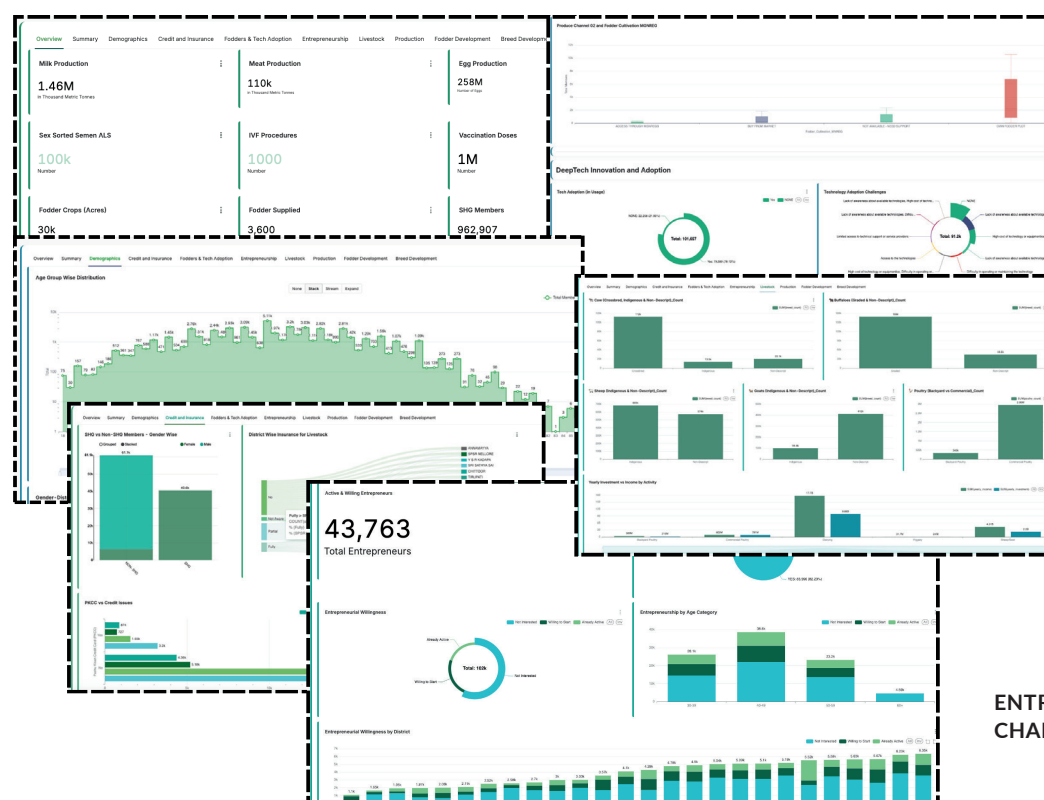


## 7. DATA ANALYSIS: OUR ANALYSIS SNIPPET

### SUMMARY

### DEMOGRAPHICS & TECH ADOPTION

### CREDIT & INSURANCE



### FODDER DEVELOPMENT

### LIVESTOCK, MILK & MEAT PRODUCTION

### ENTREPRENEURSHIP, VALUE CHAIN & OTHER KPIs

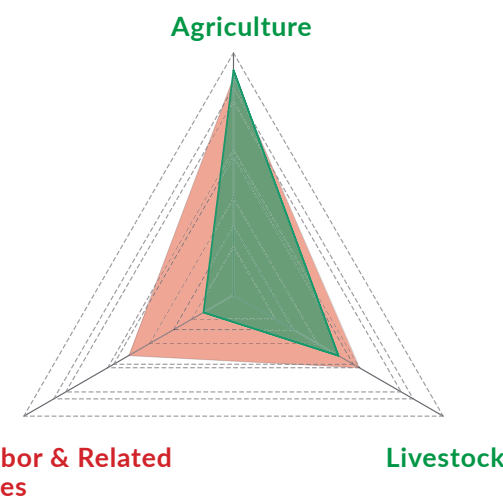
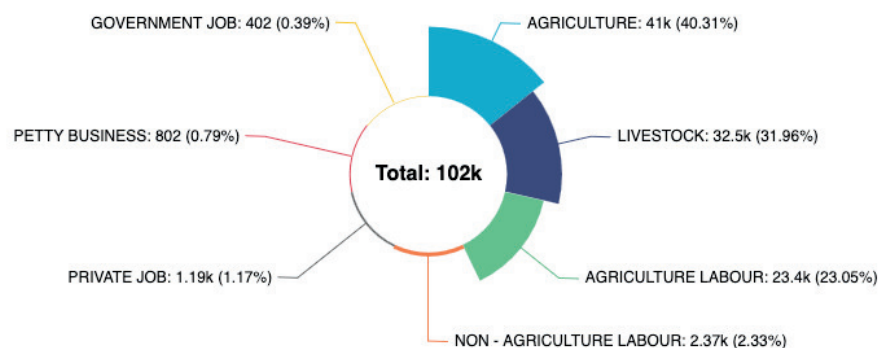
Disclaimer: The analysis is subjected to quality of data collected  
Representational Data for understanding



## ENVISIONED INCOME GENERATION ACTIVITY-CHART

Income\_Source

■ AGRICULTURE 
 ■ LIVESTOCK 
 ■ AGRICULTURE LABOUR 
 ■ NON - AGRICULTURE LABOUR 
 1/3 
 (All) (Inv)

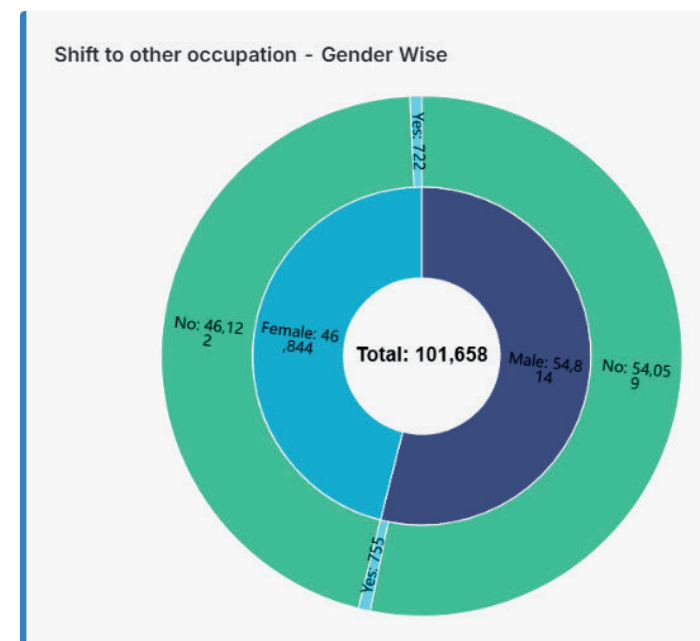
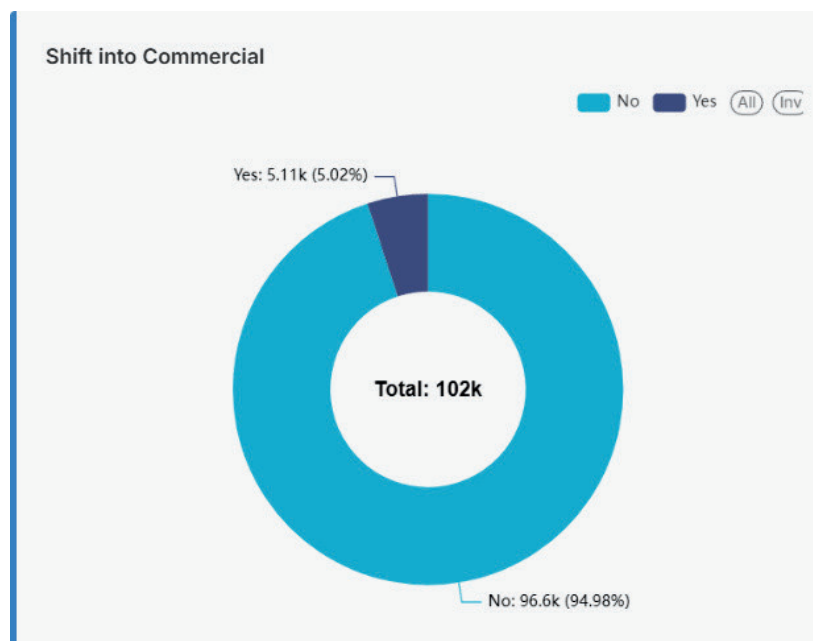


### SUMMARY

- % of time-spent Agriculture and Livestock to be kept as quid-pro-quo for 2025-27
- 25-30% growth time spent on income generating activities is envisioned reducing dependencies and financial stability
- % of time-spent as Agri-labour or other activities to be reduced in the same timeline ensuring self-sustainability and sectoral growth



## SHIFT TO OTHER DOMAINS

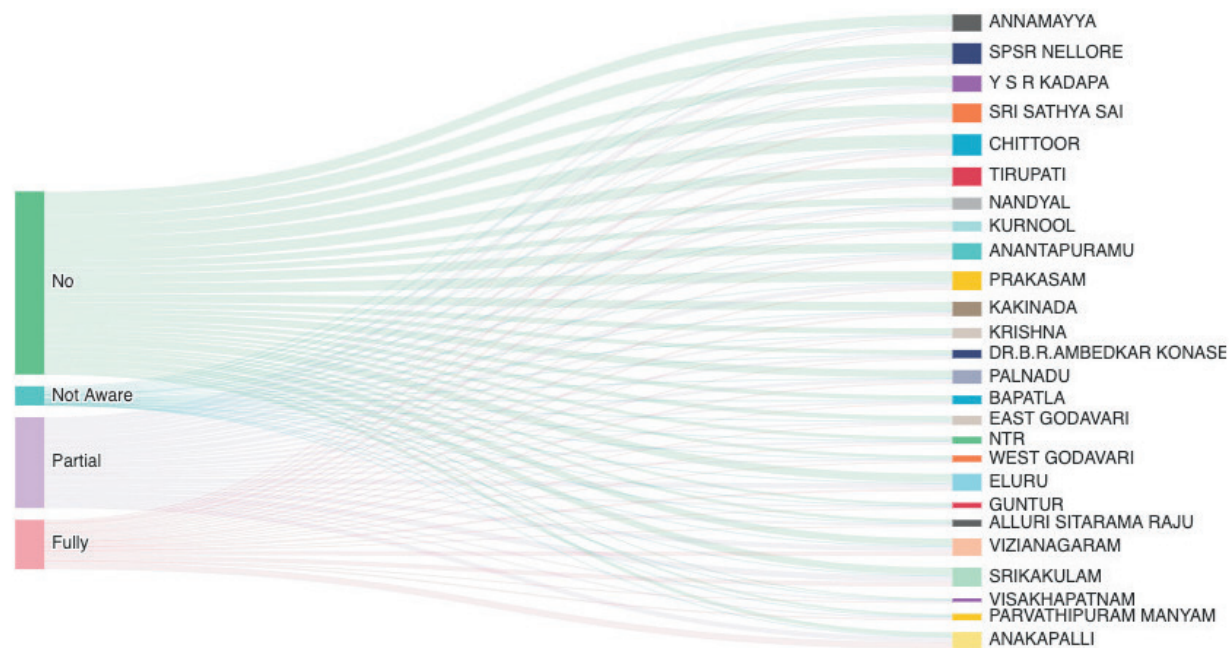


## SUMMARY

- Shift to Commercial for 5% respondents shows a gap in last mile benefit for 5000+ members
- More than 98% would still rely in Livestock business without any other thoughts of other sectors or industries which is a positive sentiment on Sector Growth Scope, More Youngsters willing to be entrepreneurs, and especially a good gender split of 51:49 (M:F) as a step towards ESG



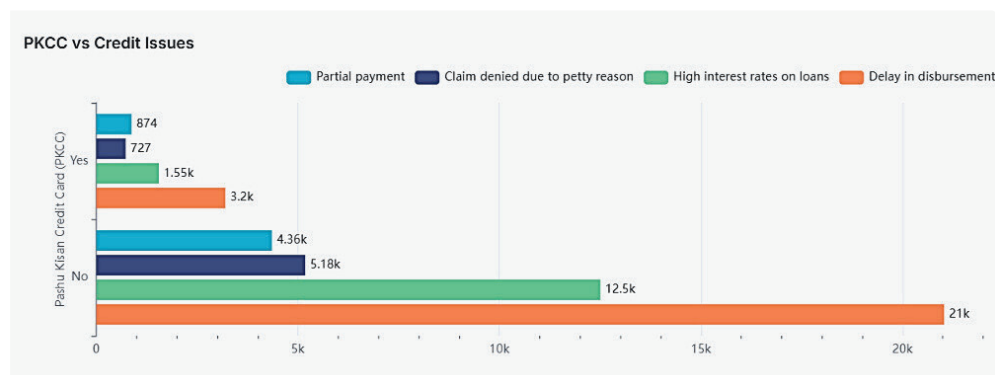
## DISTRICT WISE INSURANCE FOR LIVESTOCK



### SUMMARY

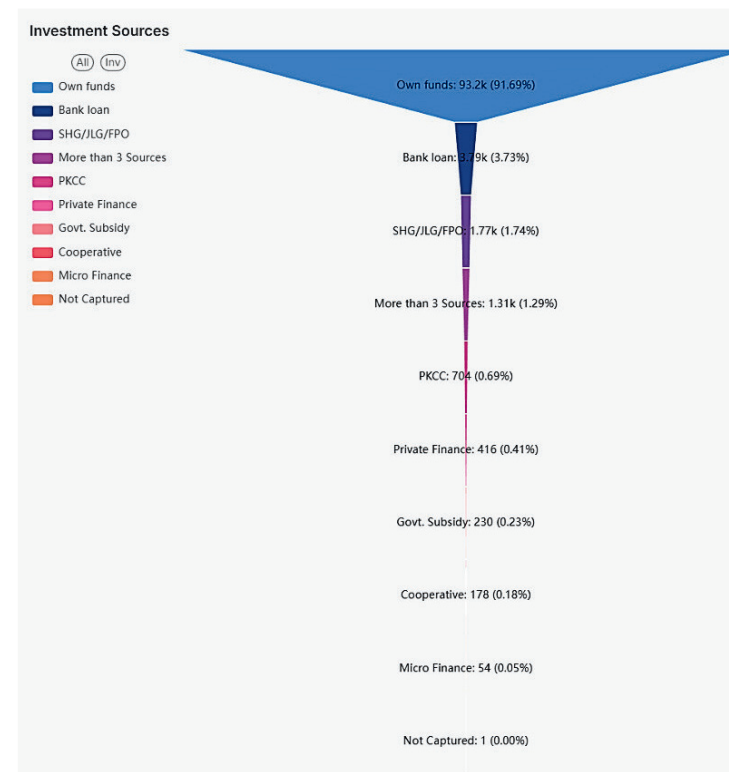
- Anakapalli contributes to 15% of Full Insurance for Livestock
- A total of 5,711 respondents mentioned that they are not aware of any Insurance and awareness programs should be planned for all such cohorts

## CREDIT & INVESTMENT



### SUMMARY

- Pashu Kisan Credit Card Beneficiaries and Non-subscribers have the same pattern of issues and 92% of respondents (approx. 94,000 population) invest with their “Own funds”:
- More than 50% of respective categories are facing delay in disbursement
- Approx. 25-30% are facing high interest rate on loans
- By promoting tech interventions, such as subsidized access to technology, enhanced & streamlined credit facilities, and insurance, the ecosystem can be enhanced further that allows smart farmers and women to thrive. Through the uberization of knowledge, it can be ensured that every stakeholder, from the government to startups and tech companies, comes together to create a seamless, collaborative environment

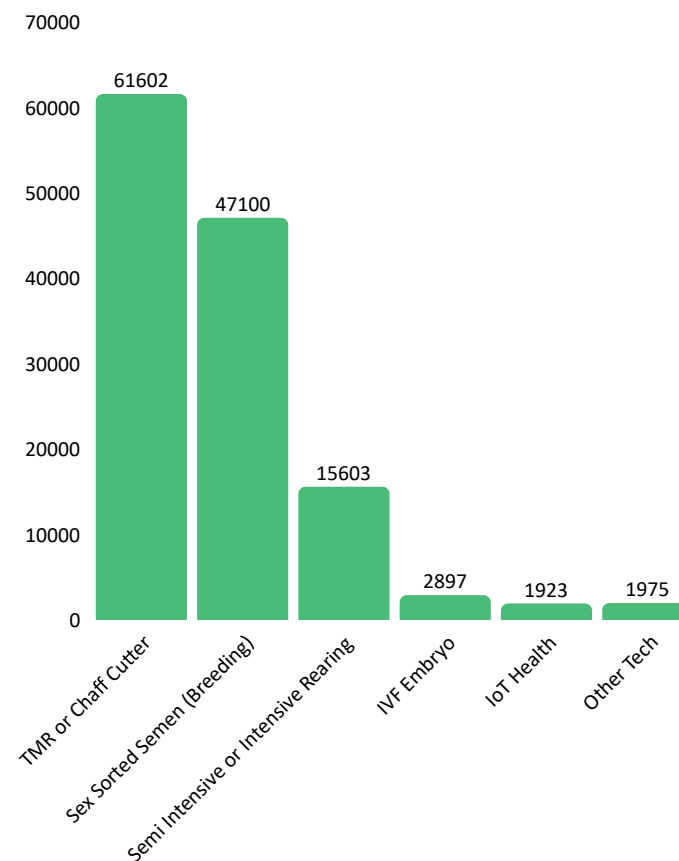
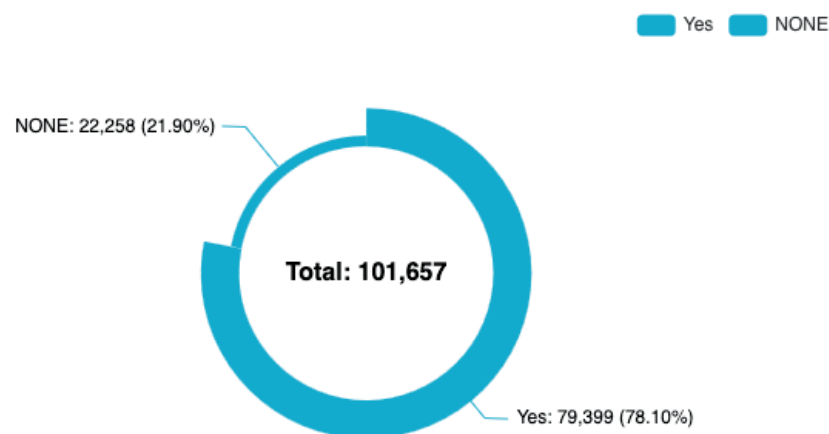






## TECHNOLOGY ADOPTED AND IN USE

Tech Adoption (in Usage)



### SUMMARY

- Impressive Tech adoption considering 78% of respondents saying yes however IoT adoption is still less than 0.01% (Standalone adoption)
- Sex Sorted Semen Stands second and is on trending for dairy (Cow & Buffalo) at 47% is topic of interest across various stakeholders



## 8. COHORT ANALYSIS

### About

Total 1.16 Lakh records (approx.) were provided in the dataset based on proprietary survey for Farmers in Andhra Pradesh

### Inference:

End-to-end visibility on major aspects for initial data cleaning  
Quality of data is found and the same has been depicted in analysis to maintain accuracy as per raw survey data provided  
32+ New Columns in focus areas of Tech Adoption, Mentorship, Entrepreneurship challenges, Market Access Challenges, Credit & Insurance, Access & Fodder, Cluster ID etc have been appended and 28+ columns in raw data have been dropped in analysis for ML model to understand patterns better



## DATASET PROVIDED: SURVEY (APRIL 2025)

### DATA SHAPE FOR EDA:

**1,01,657** Rows  
**100** columns

### FINAL DATA SHAPE FOR UNSUPERVISED LEARNING (ML):

**1,01,657** Rows  
**132** columns



## CREATING CITIZEN ARCHETYPES USING MACHINE LEARNING TO OPTIMIZE THE ROLLOUT OF BENEFIT PROGRAMS

### Cluster 1

**FARMERS**  
**6,957**

#### Small Dairy-Poultry Rearers

##### Key Characteristics:

- 51% own cows, 59% own buffalo
- 12% have backyard poultry (higher than average)
- 67% sell through local markets, 16% through local vendors
- 14% joint families, 26% nuclear families
- 95% married, 1% widowed
- Social groups: BC (23%), OC (12%), SC (5%)
- 88% use own funds for investment
- Feed: GF+DF combinations (72%)
- 94% not part of cooperatives/FPOs
- Minimal commercial poultry (0.3%)



Representational Data For Understanding

### Cluster 2

**FARMERS**  
**4,928**

#### Poultry & Pig Entrepreneurs

##### Key Characteristics:

- 91% own backyard poultry (highest among clusters)
- 2% own pigs (only cluster with significant pig ownership)
- 72% sell through local markets, 16% through local vendors
- 14% joint families, 24% nuclear families
- 93% married, 1.7% widowed
- Social groups: BC (23%), OC (7%), SC (6%)
- 91% use own funds for investment
- Feed: High concentrate use (22%) and mineral mixtures (10%)
- 98% not part of cooperatives/FPOs
- Low dairy ownership (24% cows, 25% buffalo)





## CREATING CITIZEN ARCHETYPES USING MACHINE LEARNING TO OPTIMIZE THE ROLLOUT OF BENEFIT PROGRAMS

### Cluster 3

**FARMERS**  
**10,181**

#### Subsistence Mixed Farmers

##### Key Characteristics:

- 74% own milch buffalo but only 25% own cows
- 59% sell through local markets, 29% through local vendors
- 12% joint families, 25% nuclear families
- 96% married, 1.6% widowed
- Social groups: BC (17%), OC (13%), SC (6%)
- 91% use own funds for investment
- Feed: GF+DF combinations (45%) and green fodder alone (17%)
- 98% not part of cooperatives/FPOs
- Minimal poultry (7% backyard) or other livestock



Representational Data For Understanding

### Cluster 4

**FARMERS**  
**11,828**

#### Sheep/Goat Meat Producers

##### Key Characteristics:

- 61% own sheep, 56% own goats (highest among clusters)
- 85% sell through local markets
- 4% joint families, 4% nuclear families
- 96% married, 0.7% widowed
- Social groups: Mostly blank records (92%), with some BC (7%)
- 94% use own funds for investment
- Feed: Strong preference for green fodder (25%) and GF+DF (39%)
- 99% not part of cooperatives/FPOs
- Very low dairy ownership (5% cows, 6% buffalo)





# CREATING CITIZEN ARCHETYPES USING MACHINE LEARNING TO OPTIMIZE THE ROLLOUT OF BENEFIT PROGRAMS

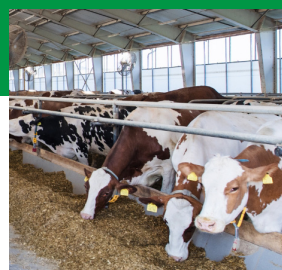
## Cluster 5

**FARMERS**  
**20,709**

### Large-Scale Dairy Commercialists

#### Key Characteristics:

- Predominantly owns milch buffalo (98.5%) but rarely owns cows (0.06%)
- Primarily sells through local markets (61%) and local vendors (23%)
- Mostly nuclear families (12% joint, 12% nuclear)
- 93% married, with low widowhood (1%)
- Social groups: Mostly BC (8%), OC (7%), SC (3%)
- 96% use own funds for investment
- Feed: Heavy reliance on green fodder + dry fodder combinations (GF+DF patterns)
- 99.5% not part of any cooperative/FPO
- Minimal involvement in other livestock (sheep 0.1%, goats 0.07%)



Representational Data For Understanding

## Cluster 6

**FARMERS**  
**18,594**

### Dairy-Centric Farmers

#### Key Characteristics:

- 100% own milch cows (unique among clusters)
- 53% sell through local markets, 17% through local vendors
- 8% joint families, 12% nuclear families
- 95% married, 1.2% widowed
- Social groups: BC (13%), OC (5%), SC (2%)
- 93% use own funds for investment
- Feed: GF+DF combinations dominate (72% use some form of green+dry fodder)
- 98% not part of cooperatives/FPOs
- Minimal backyard poultry (7%) or other livestock





## CREATING CITIZEN ARCHETYPES USING MACHINE LEARNING TO OPTIMIZE THE ROLLOUT OF BENEFIT PROGRAMS

### Cluster 7

**FARMERS**  
**6,607**

#### Elite Dairy Entrepreneurs

##### Key Characteristics:

- 58% own cows, 70% own buffalo
- 64% sell through local markets, 16% through local vendors
- 11% joint families, 17% nuclear families
- 95% married, 0.5% widowed (lowest widowhood)
- Social groups: BC (13%), OC (11%), SC (2%)
- 90% use own funds for investment
- Feed: GF+DF+C+MM combinations (35% - highest balanced feed)
- 97% not part of cooperatives/FPOs
- Minimal other livestock (2% backyard poultry)



Representational Data For Understanding

### Cluster 8

**FARMERS**  
**15,560**

#### SHG-Supported Smallholders

##### Key Characteristics:

- 58% own cows, 50% own buffalo (balanced dairy)
- 56% sell through local markets, 19% through local vendors
- 31% joint families, 69% nuclear families (highest nuclear %)
- 97% married, 2% widowed
- Social groups: BC (52%), OC (29%), SC (16%) - most diverse
- 90% use own funds, but highest SHG involvement (4%)
- Feed: GF+DF combinations (72%)
- 96% not part of cooperatives/FPOs
- Minimal other livestock involvement







## Cluster 9

**FARMERS**  
**6,293**

### Small Ruminant & Poultry Farmers

#### Key Characteristics:

- 55% own goats, 48% own sheep (second highest after Cluster 4)
- 4% have backyard poultry
- 85% sell through local markets, 11% through local vendors
- 30% joint families, 69% nuclear families
- 98% married, 1.6% widowed
- Social groups: BC (63%), SC (18%), ST (11%) - high ST representation
- 89% use own funds, but 4% use SHG/JLG/FPO (second highest)
- Feed: Green fodder alone (28%) and GF+DF (36%)
- 96% not part of cooperatives/FPOs
- Low dairy ownership (5% cows, 5% buffalo)

Representational Data For Understanding



## Transformational Impact of DBT Schemes of GoAP: Archetype-Based Analysis

The ARISE based Direct Benefit Transfer (DBT) schemes of the Government of Andhra Pradesh (GoAP) have a profound impact on various economic cohorts of the population. These schemes, when viewed through the lens of archetypes, demonstrate a transformative pathway that enables individuals and families to improve their socio-economic conditions and achieve upward mobility and synergize Andhra Pradesh's animal husbandry.

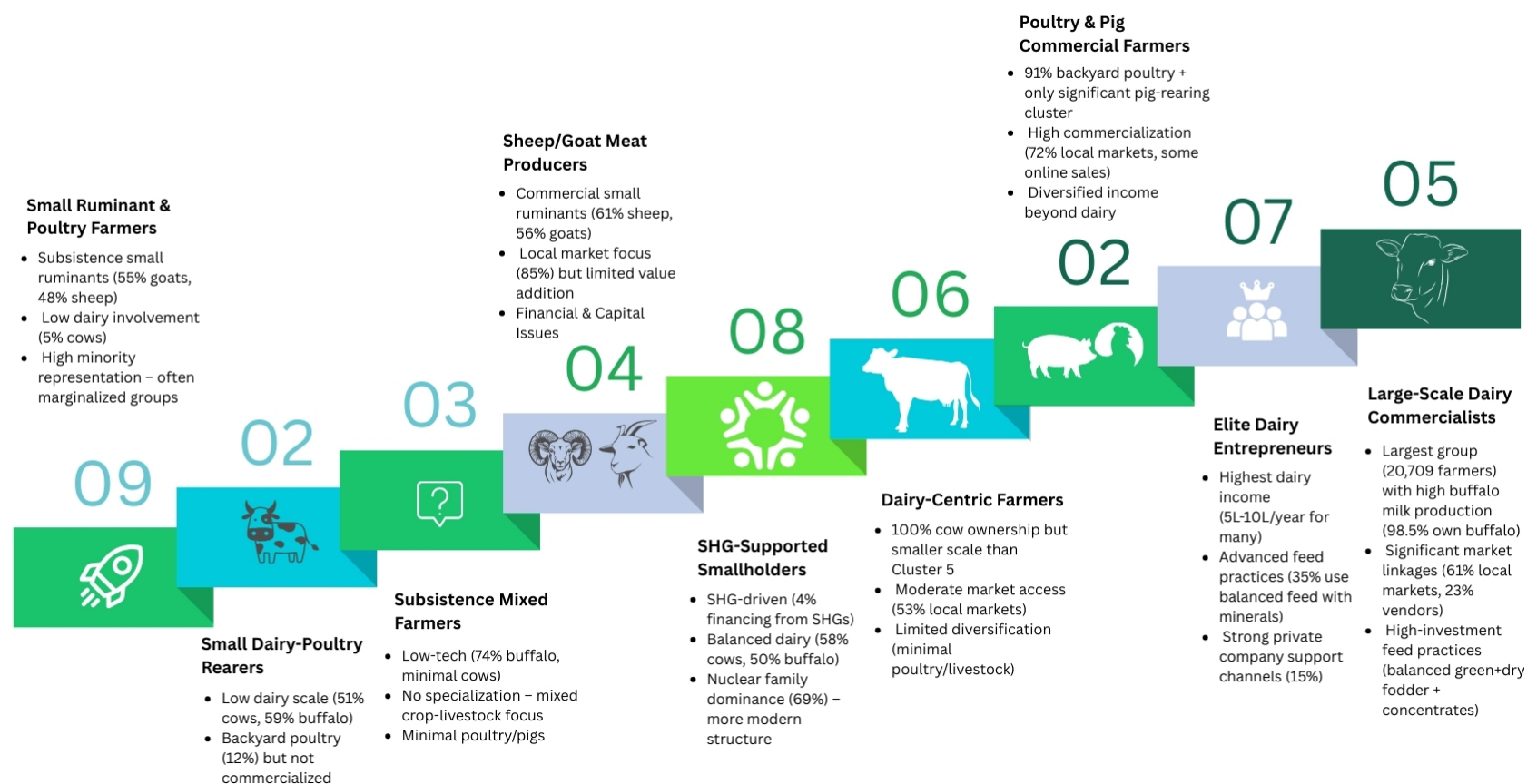
### 1. Extremely Poor - Poor

- **Archetype:** The Survivor to the Aspirant
- The DBT schemes provide essential financial aid, access to QLYs for livestock (animals) and necessary capital for budding entrepreneurs. These interventions ensure that the basic needs of the extremely poor are met, reducing their vulnerability. The schemes act as a lifeline, lifting them out of abject poverty and enabling them to focus on small economic opportunities.
- **Example Impact:** A family receiving regular financial assistance through DBT can invest in better fodder, technology or basic vocational training for children, setting the stage for generational upliftment.

### 2. Poor - Not So Poor

- **Archetype:** The Aspirant to the Builder
- The poor cohort benefits significantly from DBT schemes designed to provide access to skilling programs, technology adoption, mentorship. By leveraging Self-Help Groups (SHGs) and micro-loans, these individuals gain financial literacy and access to entrepreneurial opportunities.
- **Example Impact:** Women empowered through SHGs under DBT, often referred to as "Lakhpatti Didis" (90,000 women entrepreneurs who became financially independent), exemplify how poor households transition to sustainable income sources, achieving a better standard of living.

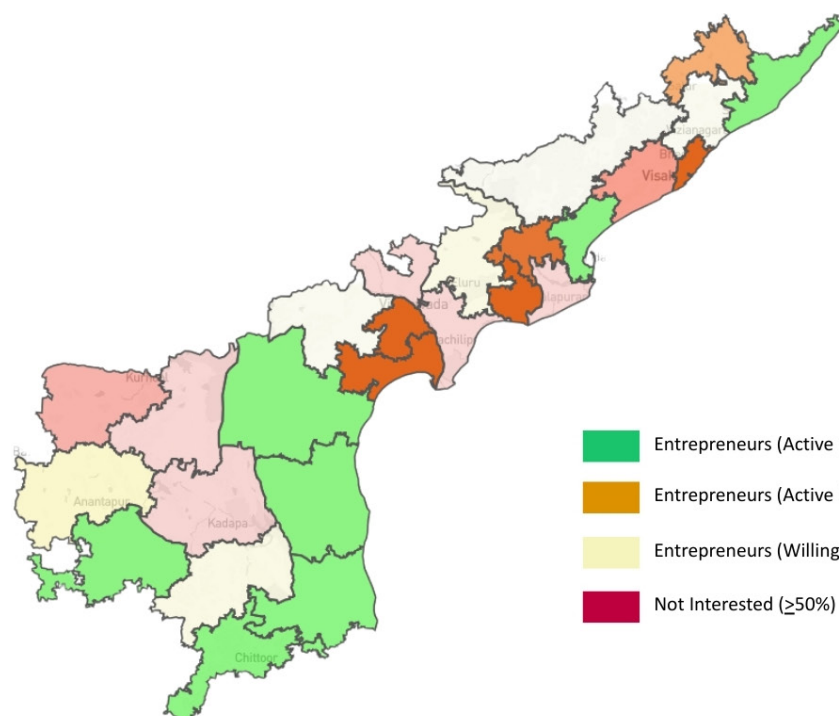
## 9. ARCHETYPE HIERARCHY: SUMMARY OF COHORTS



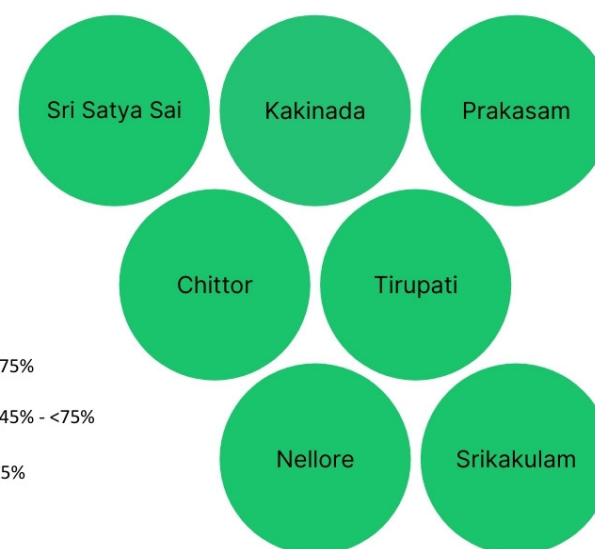




## ENTREPRENEURIAL PRESENCE & WILLINGNESS

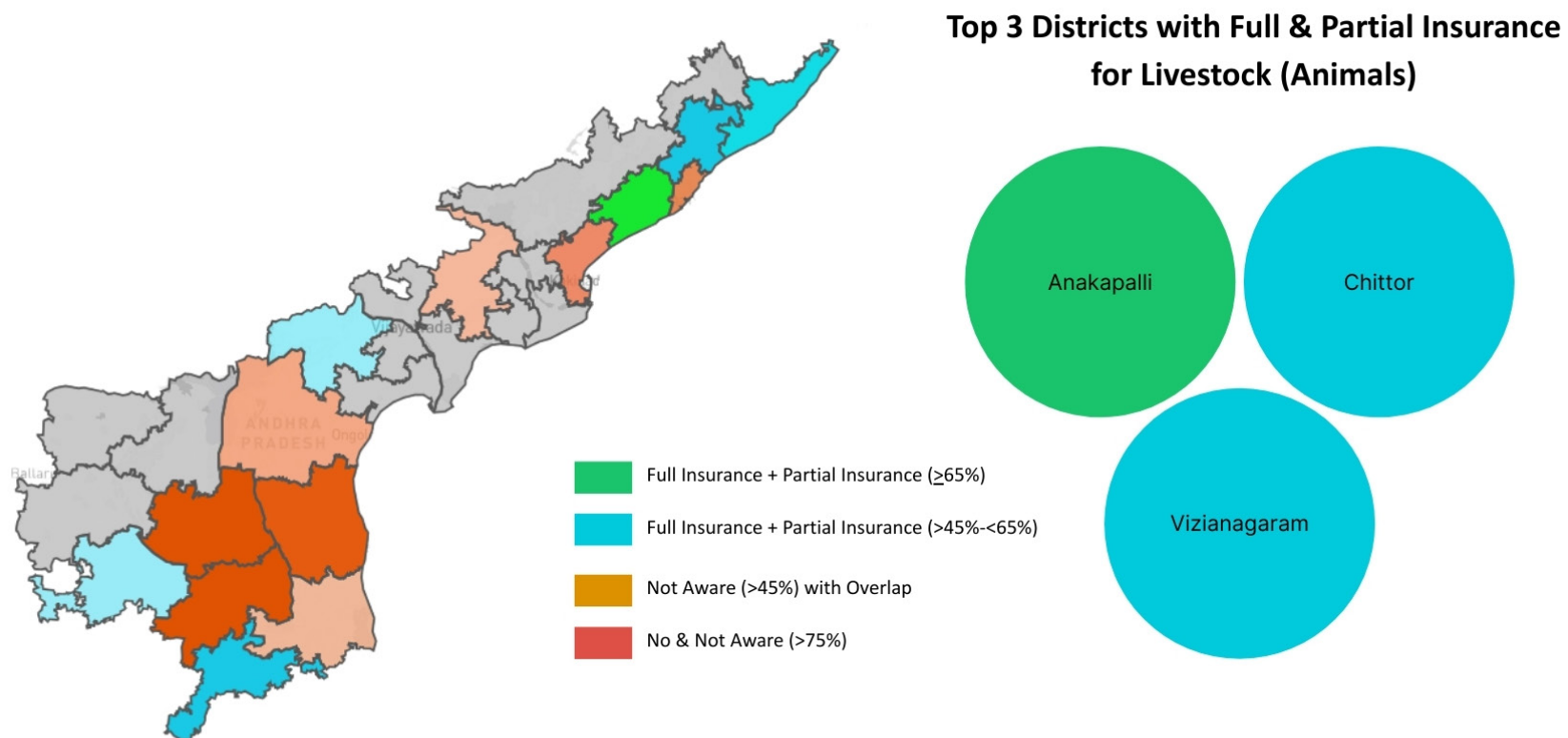


**Top 7 Districts with High Entrepreneurial Presence & Willingness**



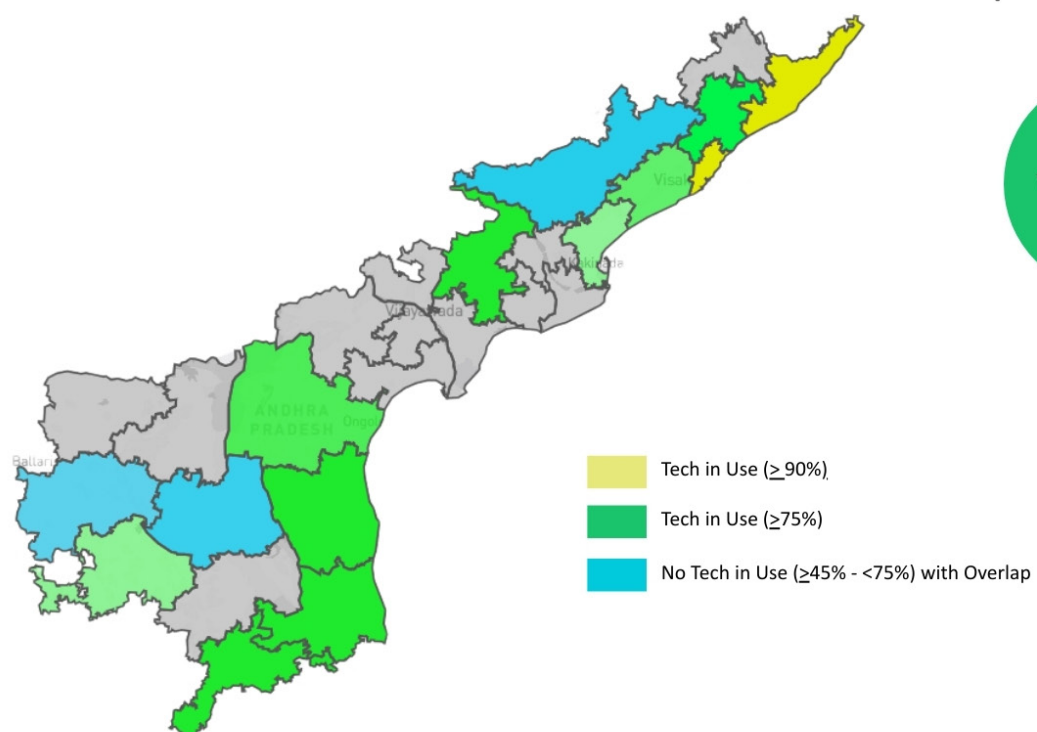


## FULL & PARTIAL INSURANCE FOR LIVESTOCK (ANIMALS)

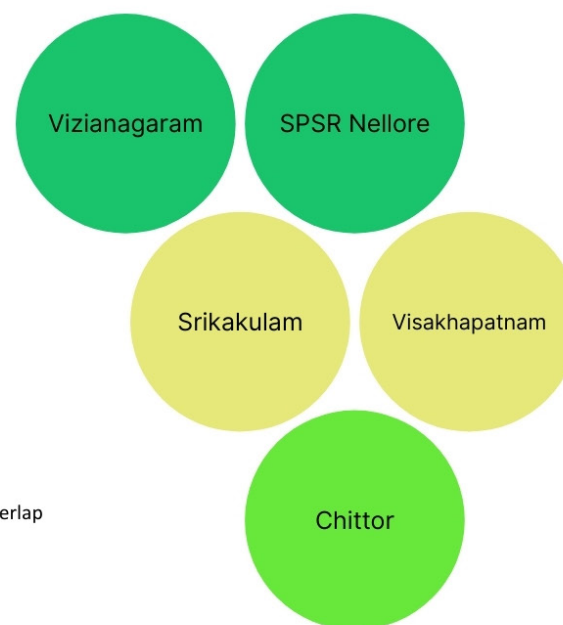




## TECHNOLOGY ADOPTION AND IN USAGE



**Top 5 Districts with Technology Adoption and in Usage**





## 10. FINANCIAL INCLUSION: CREDIT LINKAGES AND MARKET-READY FRAMEWORKS

### 10.1 Enhanced Income and Health

The implementation of our AI-driven solutions will yield significant benefits for farmers and livestock members in Andhra Pradesh, leading to improved economic conditions, enhanced animal health, and increased productivity. Farmers can anticipate higher incomes through AI-optimized feeding schedules that improve livestock growth and yields. Proactive disease management, enabled by AI-powered monitoring, will minimize livestock losses. Efficient resource utilization, guided by AI insights, will lower operational costs.

Big4 reports highlight the transformative potential of technology in agriculture. These reports affirm the industry-wide recognition of AI's potential to drive positive economic outcomes for agricultural stakeholders .

Beyond economic gains, our solutions prioritize livestock health and welfare. AI-powered monitoring systems with wearable sensors continuously track vital signs, enabling early disease detection and timely intervention. This proactive approach reduces disease severity and improves overall animal well-being. The National Animal Disease Referral Expert System (NA-DRES) in India demonstrates a national commitment to technology-driven animal health management .



Enhanced productivity and efficiency are also key benefits. AI optimizes feeding schedules and assists in breeding programs by analyzing genetic and performance data. By providing intelligent tools, GFST Think Tank aims to empower farmers to achieve higher productivity and profitability. Enhance Animal Husbandry department, further streamline access to financial services, government subsidies, and valuable information for farmers in Andhra Pradesh and across the world.



## 10.2 ENHANCING CREDIT ACCESS FOR LIVESTOCK FARMERS IN ANDHRA PRADESH: AN AI-DRIVEN ROADMAP FOR 2030 AND BEYOND

Our primary and proprietary survey of 100,000 plus farmers engaged in livestock and related activities in Andhra Pradesh reveals a critical challenge: only 3% have benefited from existing credit schemes. This stark statistic underscores a significant gap in financial inclusion within a sector vital to the state's economy. As we look towards expanding the reach of financial support to the estimated 600,000 farmers in this domain and beyond, a well-designed and innovative approach is paramount. Our Think Tank is committed to leveraging proven global frameworks and our advanced AI tools to create a robust roadmap for enhanced credit usage and disbursement, aiming for substantial impact by 2030 and beyond.

The challenges hindering credit access for livestock farmers in Andhra Pradesh are multifaceted, mirroring global trends in agricultural finance. These include the lack of acceptable collateral, as many farmers, especially smallholders and tenant farmers, may not possess formal land titles or other assets typically required by traditional lending institutions. High interest rates and unfavorable loan terms can also deter farmers from seeking formal credit. Furthermore, bureaucratic inefficiencies, limited financial literacy among farmers, and the perceived high risk associated with the agricultural sector by financial institutions contribute to this low penetration of credit.

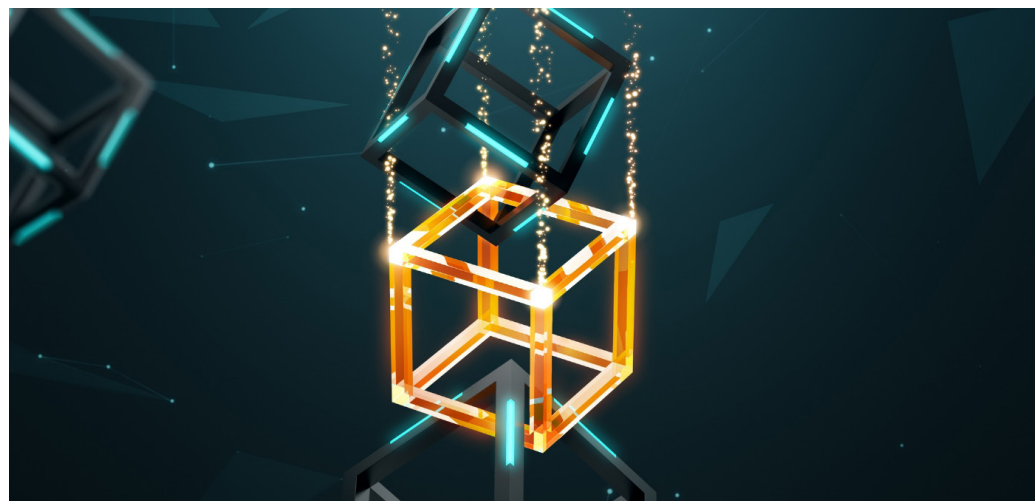




## 11. TECHNOLOGY & TRANSPARENCY: WEARABLES, DEEPTech AND OTHERS

This initiative incorporates DeepTech innovations like wearable sensors and blockchain technology to advance animal husbandry in Andhra Pradesh. Wearable sensors enable continuous monitoring of vital health parameters, transmitting data to our AI platform for early detection of health issues. This allows for timely interventions and disease prevention. The growing market for livestock monitoring technologies underscores their increasing adoption. AI in livestock farming utilizes machine learning for data analysis, automated monitoring, and predictive analytics for effective herd management.

In collaboration with the Department of Animal Husbandry and the Government of Andhra Pradesh, utilizing the P4 Model, blockchain can be integrated for a transparent supply chain. Blockchain provides an immutable record of transactions, enhancing trust in product origin and quality. This benefits consumers, farmers (through accountability and potential premium pricing), and other supply chain stakeholders through improved logistics. The integration of blockchain signifies a move towards a more reliable animal husbandry ecosystem in Andhra Pradesh.

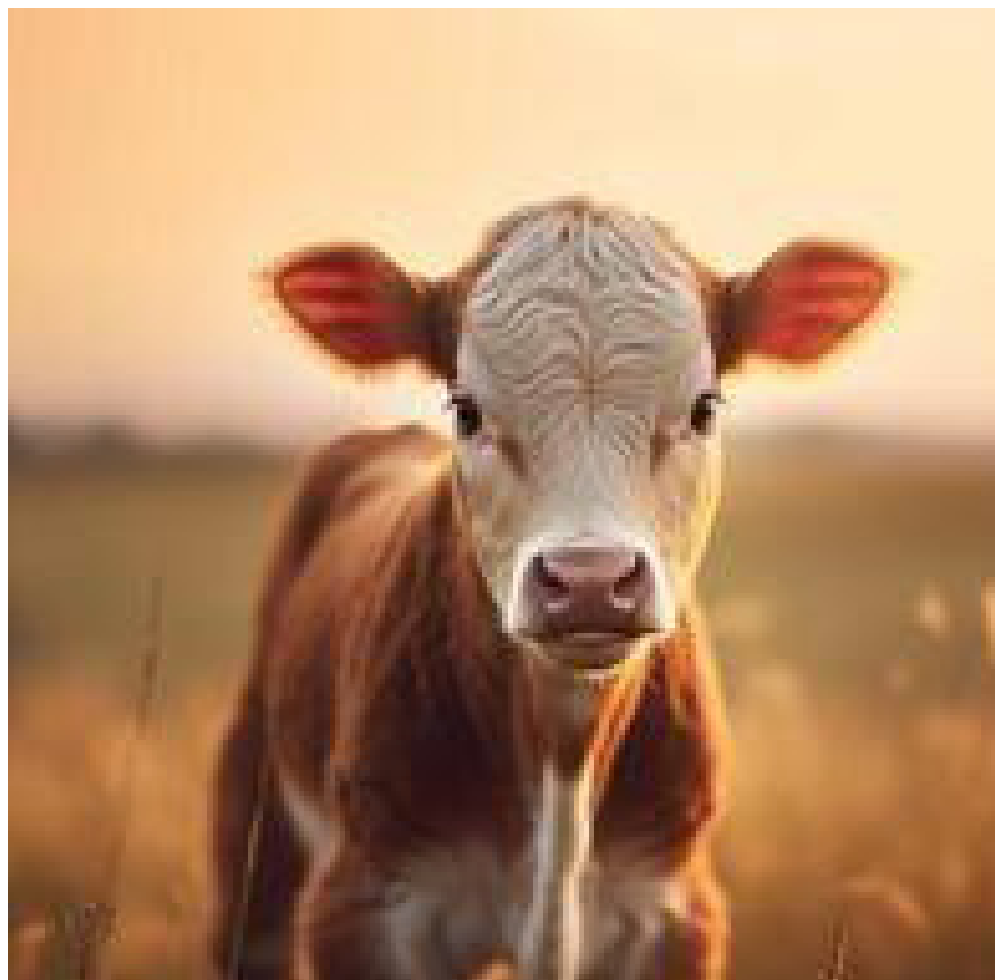


**We propose the following statistical targets for sectoral advancements:**

Target Area	Baseline (May 2025 Estimate)	Target Year 1 (May 2026)	Target Year 2 (May 2027)	Target Year 3 (May 2028)	Unit of Measurement
Increase in Livestock Productivity (Milk)	15.5 Lakh MT	16.5 Lakh MT	17.5 Lakh MT	18.5 Lakh MT	Lakh MT
Reduction in Foot-and-Mouth Disease Incidence	500 Out-breaks/Year	400 Out-breaks/Year	300 Out-breaks/Year	200 Out-breaks/Year	Out-breaks/Year
Increase in Average Farmer Income from Livestock	INR 12,000/ Month	INR 13,500/ Month	INR 15,000/ Month	INR 16,500/ Month	INR/ Month
Adoption Rate of Wearable Sensors in Livestock	5%	15%	25%	40%	%
Digitalization of Land Records	60%	75%	90%	95%	%
Access to Telemedicine Services in Rural Areas	30%	50%	70%	85%	%

*These targets reflect the commitment to driving measurable progress through DeepTech and GovTech, with SHGs playing a crucial role in adoption.*





## 12. MACRO AI FRAMEWORK: EMPOWERING 170+ COUNTRIES - A.P. AS A ROLE MODEL TOWARDS VIKASIT BHARAT

Andhra Pradesh is poised to revolutionize its development through DeepTech adoption, with AI as a key driver in bridging the gap with more developed nations and empowering the underprivileged. AI-driven solutions in animal husbandry, agriculture, healthcare, and education can provide marginalized communities with access to vital information and opportunities. In animal husbandry, AI advisory services can guide smallholder farmers on best practices, improving their livelihoods. In agriculture, AI can enhance productivity and sustainability for resource-constrained farmers.

Andhra Pradesh has the potential to become a global leader in sustainable development by ethically deploying AI to optimize resource utilization in agriculture and water management. AI-powered irrigation and feed management can promote environmentally sound practices, aligning with initiatives like the Andhra Pradesh Community-Managed Natural Farming project.

Empower 40L stakeholders (25L SHG women + 15L farmers) including increased farmer incomes and improved environmental outcomes. By prioritizing inclusivity and sustainability, Andhra Pradesh can serve as a model for other regions and countries striving for equitable and responsible technological progress.



## 13. FUTURE SCOPE: ROADMAP FOR 2030 & BEYOND

How our AI Solution is envisioned to be Sectoral Agnostic and highly scalable, interoperable with real-time data and Infrastructure with SMEs working on Data Analysis, Sectoral Aspects, Project Outcomes (Program is each domain or ministry) and RTGS.

GFST's AI solution is envisioned in design with a core architecture that is inherently sector-agnostic, readily adaptable beyond animal husbandry to agriculture, healthcare, and urban development. The fundamental principles of intelligent data management, predictive analytics, and process optimization are universally applicable .

The solution is designed for scalability and interoperability with real-time data from diverse sources, leveraging GPU power for efficient processing. This aligns with the broader trend of digital transformation in Indian agriculture, where technologies like AI, IoT, and data analytics are being increasingly adopted.

From Prediction to Prescription: Empowering Proactive Decision-Making.

Our AI and Business Intelligence (BI) solution goes beyond simply predicting future outcomes in animal husbandry; it offers prescriptive analytics, providing actionable recommen-

dations to optimize operations and mitigate potential risks. Predictive analytics utilizes historical data and statistical algorithms to forecast what is likely to happen. For instance, our system can predict the likelihood of a disease outbreak in a specific region based on past occurrences, climate data, and livestock movement patterns. This allows for proactive measures like increased surveillance or targeted vaccinations. Machine learning algorithms are crucial for these predictions, identifying complex patterns in large datasets to forecast animal diseases and other key indicators.

### Roadmap for 2030 & Beyond

Looking towards 2030 and beyond, our holistic AI & BI solution provides a clear roadmap for sustainable development and economic growth in Andhra Pradesh. By leveraging AI for predictive insights and BI for informed decision-making, the state can optimize resource allocation, enhance productivity across sectors, and improve the lives of its citizens. Our solution's ability to integrate real-time data and utilize GPU power ensures that it can adapt to future technological advancements and handle increasing data volumes. Collaboration with SMEs, who possess deep sectoral knowledge, will be crucial in tailoring our solutions to specific needs and ensuring successful project outcomes across vario





## 14. CONCLUSION: TOWARDS AN INTELLIGENT, AND SUSTAINABLE ANIMAL HUSBANDRY SECTOR IN ANDHRA PRADESH.

Andhra Pradesh's animal husbandry sector is entering a transformative era powered by Artificial Intelligence. GFST' AI-driven solutions or approaches offer a pathway to an enhanced and sector-agnostic efficiency, sustainability, and prosperity for all stakeholders. By leveraging intelligent data management, AI-optimized operations, and predictive analytics, we aim to unlock the sector's full potential.

The integration of DeepTech like wearable sensors and blockchain further strengthens our capabilities in animal health monitoring and supply chain transparency. We envision Andhra Pradesh as a leader in AI-driven sustainable development.

Our sector-agnostic AI solution, in collaboration with SMEs and aligned with the state's RTGS, is poised to drive comprehensive advancements across various government domains. We invite partners to join us in this journey towards an intelligent, efficient, and sustainable future from Andhra Pradesh to the World: A Model of Innovation, Empowering 170+ Countries by 2030

## GFST SPOTLIGHT



**S P Tucker (IAS Retd.)**  
*Vice Chairman & Director*



**Sanjay Gupta (IFS Retd.)**  
*Chief Executive Officer*



We at the Global Forum for Sustainable Transformation (GFST) warmly invite individuals, organizations, and institutions from all walks of life to partner with us and collaborate in shaping a sustainable and innovative future for India.

To Bureaucrats and Decision Makers in Governments:  
GFST stands as your trusted partner in driving impactful change. We are here to offer expert consulting assignments and pro-bono research to support your initiatives and align them with sustainable development goals and cutting-edge technology trends. Let's work together to create strategies and solutions that inspire progress and empower communities worldwide.





## AUTHORS



**Sridhar Seshadri**

*Director, Global Foresight & Innovation*



A SHIFT TO PRESCRIPTIVE ANALYTICS WHERE AI INTEGRATES REAL-TIME DATA STREAMS INTO ADAPTIVE ROADMAPS, ANTICIPATING GLOBAL TRENDS BEFORE THEY EMERGE. ”



**Shreeram Iyer**

*Director, Global Impact*



AI-DRIVEN IMPACT MODELING CALIBRATES RESOURCES AND MEASURES OUTCOMES TO DRIVE SCALABLE SUSTAINABILITY AND INCLUSIVE GROWTH. ”

## CO-AUTHORS



**Anand Sharma**

*Technical Partner*



**Shakeel Dhada**

*Technical Partner*



**Binish Thomas**

*Technical Partner*



**Saurabh Sharma**

*Technical Partner*



## CONTACT US



GLOBAL FORUM FOR  
SUSTAINABLE TRANSFORMATION



+91 - 81210 17017



admin@gfst.in



gfst.in



Regd. Office: #409, Fourth Floor,  
Plot No.14 Shangrila Plaza, Road No.2,  
Banjara Hills, Hyderabad, Telangana-50003

### GFST as a Catalyst

The GFST Conclave 2025 is not just an event-it is the cornerstone of India's DeepTech and GovTech journey. By creating networks of change agents and institutional systems, GFST inspires:

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**GFST Authors:**

Mr. S P Tucker, Mr. Sanjay Gupta, Mr. Sridhar Seshadri, Mr. Shreeram Iyer,  
Mr. Anand Sharma, Mr. Shakeel Dhada, Mr. Binish Thomas, Mr. Saurabh Sharma

**Honorary Research Contributors:**

Mr. Narayanswamy (Vera Business Consulting LLP),  
Ms. Vidya Sree

**Photo Credits & Designs:**

Mr. Nagaraju (Vera Business Consulting LLP)

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