Integrated Agri Labs

Andhra Pradesh, being a predominantly agrarian state, places agriculture and farmers' welfare at the core of its development agenda. Ensuring the availability of quality agricultural inputs, namely seeds, fertilizers, and pesticide is vital to enhancing crop productivity and reducing the cost of cultivation for farmers.

Although the state presently operates a network of 11 testing laboratories (3 Seed Testing Labs, 3 Fertilizer Testing Labs, and 5 Pesticide Testing Labs), these facilities are often limited in capacity, inadequately equipped, and not easily accessible to farmers. As a result, gaps remain in quality regulation and farmer outreach.

To bridge these gaps and improve accessibility, the Government of Andhra Pradesh has adopted an **Integrated Inputs Quality Control Framework** based on a **Two-Tier Laboratory Model**, designed to ensure timely, scientific, and farmer-friendly quality testing services.

The Two-Tier Model:

1. ### Constituency-Level Labs (Tier-1):

   These serve as Preliminary Testing and Farmer Outreach Centers, located at the Sub-Division level. They:

   - Provide easy and direct access to farmers.
   - Undertake preliminary testing of **Seeds** and **Fertilizers**.
   - Function as **Satellite Collection Centers** for **Pesticide samples**, which are then forwarded to the corresponding District Labs for detailed analysis.
   - Promote farmer engagement, awareness, and education on input quality.

2. District-Level Labs (Tier-2):

These act as Advanced Testing Facilities, equipped with higher-end instruments and scientific personnel to:

- Conduct comprehensive testing of **Seeds, Fertilizers, and Pesticides**.
- Validate and supplement the findings of the constituency labs.
- Ensure regulatory enforcement and compliance at a broader scale.

3. Regional Coding Centers (4 Zones):

To strengthen the integrity of the quality control process and eliminate scope for manual discretion or malpractice, **four dedicated Regional Coding Centers (RCCs)** have been established across the state. These centres serve as a critical link in ensuring anonymity and objectivity in the testing workflow.

Key Functions of RCCs:

- RCCs **receive samples from Input Inspectors** and transfer their contents into **fresh, unlabelled coded containers**, effectively **masking the sample's origin**.
- The **original identity and source details of the sample are concealed**, ensuring that:
  - The **Input Inspector does not know** which laboratory is testing their sample.
  - The **Testing Laboratory remains unaware** of the source or origin of the sample.
- This **double-blind process** minimizes the risk of external influence or manipulation at any stage.

- The entire coding operation is executed through the **InSight App**, which:
    - Assigns a **new encrypted Sample Code** to each sample, replacing the original Sample ID.
    - Ensures secure, tamper-proof and fully traceable sample movement through the system.

By introducing this layer of **sample anonymization and digital tracking**, the Regional Coding Centers play a pivotal role in building **trust, transparency, and credibility** in the agricultural input quality control ecosystem.

All three components "**Constituency Labs, District Labs, and Regional Coding Centers"** are integrated through a centralized software application known as **"InSight App"**, which:

- Connects Constituency Labs, District Labs, Regional Coding Centers, Input Inspectors, District Agriculture Officers (DAOs) and the Head of Department (HoD).
- Enables end-to-end tracking of samples, real-time monitoring and digital reporting.
- Reduces manual errors and improves accountability across the system.

Objectives of Agri Testing Labs:

- Quality & certified Agri inputs are supplied to farmers.
- Pre tested Agri inputs are supplied to farmers through RSKs.
- Integrated Agri Labs will enhance the production and productivity of the Crops and ensure efficient use of resources by farmers.
- Reduce Cost of Cultivation
- Agri labs are reachable to farmers for testing any Agri input prior to usage.

No.of Integrated Agri Testing Labs

The state of Andhra Pradesh comprises **175 Assembly Constituencies**, out of which **15 are urban** in nature. Given the agricultural dependency in rural regions, it was assessed that **160 rural constituencies** require dedicated agricultural input testing facilities.

At the time of conceptualization, the state had **13 districts**. Accordingly, the proposal aimed to establish a **Two-Tier Testing Infrastructure** consisting of:

- **13 District-Level Integrated Agri Labs** by upgrading and integrating existing Seed, Fertilizer, and Pesticide Testing Labs.
- **147 Constituency-Level Agri Labs** in rural constituencies (excluding urban and overlapping areas).
- **4 Regional Coding Centers** to handle anonymized sample coding and secure digital integration.

The initiative is being implemented with a total budget outlay of **₹213 Crores**, comprising:

- Rs 150 Crores under **NABARD - RIDF Tranche XXV**
- Rs 63 Crores under PM-**RKVY (DPR)**

Current Status:

- **127 out of 147 Constituency Agri Labs** have been **inaugurated and are currently functional**, conducting **seed and fertilizer testing** services at the grassroots level.
- **9 out of 13 District Labs** have achieved **90% physical progress** and are expected to be **completed and made operational by Aug 2025**.

This integrated approach ensures that farmers across the state have accessible, timely, and reliable testing services, which play a vital role in enhancing the quality of agricultural inputs and building a robust input regulation ecosystem.

Type of samples tested in Integrated Agri Labs:

In Agri Labs samples analyzed are
a) ACT samples
b) RSK Samples
c) Farmer samples
d) Trade samples

The Integrated Agri Labs (IALs) play a crucial role in ensuring the availability of quality inputs to farmers by covering various channels of input supply.

I. Act Samples:

- MAOs and ADAs are notified and designated as input inspectors under the Seed Act 1966, Fertilizer (Control) Order 1983, and Insecticide Act 1968 to regulate Agri Inputs.
- They visit dealer premises and draw samples and send them to Regional Coding Center's. The RCC codes the samples and sends them randomly to IALs for testing. If any sample is found to be substandard, the input inspector seizes the stocks and initiates legal action against the dealers and manufacturers.
- IALs enforce regulatory standards by thoroughly testing input samples under relevant acts, ensuring that substandard products are identified, and appropriate actions are taken to protect farmers.

II. RSK Samples:

- IALs also play a critical role in the functioning of Rythu Seva Kendralu (RSKs).
- Inputs intended for sale in RSKs are pretested in IALs to ensure they meet the prescribed quality standards. Once the inputs are confirmed to be of high quality, they are displayed in digital kiosks within RSKs, allowing farmers to place their orders confidently.
- The IALs ensures that farmers have access to reliable and superior-quality inputs through RSKs.

III. Farmer Samples:

- IALs provide services to farmers free of charge, allowing them to directly submit their samples for testing.
- Farmers can visit IALs or submit their samples through RSKs. By testing farmer samples, IALs ensure that individual farmers can verify the quality of the inputs they are using.

IV. Trade Samples:

- IALs also cater to the trade sector by offering their facilities to traders and Manufacturers for a nominal charge.
- This facility allows traders to have their products certified through the testing services provided by IALs, instilling confidence in the quality of their offerings.

Types of tests conducted in Constituency Integrated Agri Labs:

Input	Type of tests conducted in Agri Labs	
	Constituency Agri Lab	**District Lab**
Seed	Physical Purity, Moisture and Germination	All tests will be conducted as per FCO, 1985 and Seed Act, 1966 & Seed (control) Order, 1983
Fertilizer	Straight Fertilizers / Complexes / Mixtures of Nitrogen, phosphorus & potash Zinc, Boron, Calcium, Iron	
Pesticide	Satellite Centre /Collection point	

Types of tests conducted in District Integrated Agri Labs:

Input	Constituency Agri Lab	District Agri Lab
Seed	Physical Purity Moisture Content Germination Percentage Seed Vigour Seed Viability Elisa Test	All tests will be conducted as per Seed Act, 1966 & Seed (control) Order, 1983 , FCO, 1985 Insecticide Act, 1968 and

Fertilizer	Nutrient Analysis for: Nitrogen (N), Phosphorus (P), Potash (K) Micronutrients: Zinc, Boron, Calcium, Iron etc	
Pesticide	Test all Pesticides	

Staffing Pattern & Notification of Laboratories

1. **Constituency-Level Agri Labs:**

- Each **Constituency Agri Lab** is staffed with:
  - **1 Agriculture Officer (AO)** – designated as the **Official Analyst**.
  - **2 Agricultural Extension Officers (AEOs)** – designated as **Junior Analysts**.
- All AEOs assigned to labs are required to possess a **B.Sc. in Agriculture**, ensuring they are technically qualified for laboratory operations.
- **127 Constituency Agri Labs**, which have already been inaugurated, have been **formally notified** by the **Agriculture & Cooperation Department, Government of Andhra Pradesh**.
- The **Assistant Director of Agriculture (ADA)** of the respective Sub-Division acts as the **Supervisory Officer** for all labs under their jurisdiction, ensuring oversight, accountability, and quality standards.

2. **District-Level Agri Labs:**

- Each **District Integrated Agri Lab** is designed to operate with the following staffing structure:
  - **1 Assistant Director of Agriculture (ADA)** – who functions as the **Official Analyst** and overall in-charge of the lab.
  - **12 Agriculture Officers (AOs)** and **12 Agricultural Extension Officers (AEOs)**.

- The staffing is organized by input category, with:
    - **4 AOs and 4 AEOs** dedicated to **Seed Testing**.
    - **4 AOs and 4 AEOs** for **Fertilizer Testing**.
    - **4 AOs and 4 AEOs** for **Pesticide Testing**.
- AEOs must possess a **B.Sc. in Agriculture** qualification to ensure technical competency in all analytical procedures.

This structured staffing pattern ensures effective functioning of the labs, scientific rigour in testing, and institutional accountability at both constituency and district levels.

Benefits to the farmers due to Integrated Agri Labs (IALs):

- **Accessibility:** The integrated Agri labs are established at the Agriculture Sub-Division level, making them easily accessible to farmers. This proximity allows farmers to conveniently access the labs for testing any agricultural input prior to usage. Previously, the limited number of labs and their locations posed a challenge for farmers to access quality testing facilities.

- **Quality assurance:** The integrated Agri labs focus on ensuring that only quality and certified agricultural inputs are supplied to farmers. By conducting comprehensive tests on seeds, fertilizers, and pesticides, these labs help in identifying and eliminating substandard or adulterated inputs. This ensures that farmers receive inputs that meet quality standards, leading to improved crop productivity.

- **Pre-tested inputs:** The Integrated Agri Labs (IALs) collaborate with RSKs to provide farmers with pre-tested agricultural inputs. Through rigorous testing and certification, the IALs ensure that the inputs meet prescribed standards before they are made available for sale at RSKs, enabling farmers to access reliable and quality inputs. This helps farmers make informed decisions while purchasing inputs, leading to better agricultural practices.

- **Enhanced production and productivity**: The establishment of integrated agri labs aims to enhance the production and productivity of crops. By providing farmers with accurate and reliable testing services, these labs contribute to the adoption of improved farming techniques. Farmers can optimize the use of resources based on the lab test results, leading to efficient resource management and increased crop yields.

- **Cost reduction:** The IALs play a crucial role in reducing the cost of cultivation for farmers. By ensuring the availability of quality inputs, farmers can avoid losses caused by the use of substandard or ineffective agricultural inputs. Additionally, the labs enable farmers to make informed decisions regarding input purchases, preventing unnecessary expenses on low-quality or unnecessary inputs.

- **Increased awareness:** With the establishment of IALs, farmers gain access to valuable information and knowledge related to agricultural inputs. The lab staff can provide guidance to farmers regarding the selection and proper use of inputs based on the test results. This helps in creating awareness among farmers about the importance of using quality inputs and adopting best practices in agriculture.

- **Effective Quality Control:** The IALs minimize manual intervention and provide a more objective approach to quality control. By utilizing automated analysis reports and the InSight app for monitoring quality control issues, the labs reduce the scope for discretion and ensure consistent and standardized testing procedures. This enhances the overall reliability and accuracy of the testing process.

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InSight –Quality control App

The Government of Andhra Pradesh has taken the initiative to address the issues and bring greater transparency to the quality control process through the implementation of a new automated sampling system called “InSight”.

What is “InSight”

InSight is an AI/ML-based platform that connects input manufacturers, input dealers, sample collection teams, input inspectors, regional coding centres, integrated agri labs and farmers.

The implementation of InSight is envisaged in three stages.

Stage 1: Sampling, Coding, Results generation and Results Communication to be automated

Stage 2: Integration of InSight with Online *License* Management System (OLMS)

Stage 3: Automation of sampling process, randomly selecting the kind and variety, batch/lot, dealer outlet, and company, thereby minimizing manual intervention and discretion

Implementation of Stage 1 completed and Stage 2 is in process. Efforts are being made to completely automate the system once OLMS is integrated. The “*Insight* app” was launched on July 8, 2021.

By automating the sampling process, InSight aims to ensure the accuracy of test results and improve the transparency of the quality control process. With the implementation of InSight, the Government of Andhra Pradesh is taking a significant step towards improving the quality of agricultural inputs and promoting sustainable farming practices in the state.

Stakeholders & Process flow

The InSight and Quality Control process involves various stakeholders, each playing a crucial role in ensuring the availability of quality agricultural inputs in the market. The

Integrated Agri Labs Section, O/o Agricultural Commissionerate, Guntur oversees the entire process and assigns sample targets to districts. The District Agricultural Officer (DAO) assigns targets to Input Inspectors, who are responsible for drawing samples from dealer outlets. The samples are then dispatched to the Regional Coding Center (RCC), which assigns a unique code to the sample and sends it to the Integrated Agri Lab (IAL) for analysis. The IAL staff analyzes the samples and provides the results to the official analyst, who verifies and authorizes them before they are communicated to the Input Inspector. Through the efforts of these stakeholders, the quality of agricultural inputs is maintained, benefiting farmers and the agricultural industry.

1. **Agricultural Commissionerate, Guntur**

   The Integrated Agri Labs section of Agricultural Commissionerate, Guntur assigns sample targets to districts based on the e-cropped area and the number of dealer outlets in the districts. They monitor and oversee the entire quality control process, including sample collection, analysis, and dissemination of results, to ensure the availability of quality agricultural inputs in the market.

2. **District Agricultural Officer (DAO)**

   The DAO assigns sample targets to the Input Inspectors based on the cropped area and number of dealer outlets in their jurisdiction. They ensure that their assigned Input Inspectors carry out the sampling process as per the guidelines and within the stipulated timeframe.

3. **Input Inspectors**

   The role of Input Inspectors is crucial in ensuring the availability of quality agricultural inputs in the market. They are notified as Input Inspectors under Seed Act, Fertilizer Control Order, and Insecticide Act Acts, and as part of their job chart, they randomly visit dealer outlets to draw samples. They use the InSight-Quality Control App to enter sample details and create a unique sample ID.

   Once the samples are drawn, the Input Inspectors dispatch them as parcels to the assigned Regional Coding Center (RCC). It is their responsibility to ensure that the

samples are intact and all essential documents are included. The Input Inspectors play a critical role in the process flow as they are the first point of contact for drawing samples and ensuring their quality. Through their efforts, they help to maintain the quality of agricultural inputs in the market and protect the interests of farmers.

4. **Regional Coding Center (RCC)**

   Upon receiving the parcels from the Input Inspectors, the RCC verifies the condition of the samples and accepts them if they are intact. The RCC changes the container of the sample, hides the sample details, and assigns a separate code to the sample. The RCC dispatches the sample as a parcel, and a parcel ID is generated, which is visible to the Integrated Agri Lab (IAL).

5. **Integrated Agri Lab (IAL)**

   The IAL staff analyzes the samples received and enters the results in the dashboard against the sample code. The official analyst of the IAL verifies the entered results and authorizes the result. On results authorization, decoding of the sample takes place, and a result copy gets generated, which is addressed from the official analyst to the Input Inspector who has drawn the sample.

Potential of InSight App:

- The InSight App has the potential to revolutionize the process of ensuring the availability of quality agricultural inputs like seeds, fertilizers, and pesticides. By streamlining the process and providing a transparent and accountable system, it can help reduce the possibility of corruption and increase public trust in the agricultural sector.
- One of the significant advantages of the InSight App is that it automates the assignment of samples to the Integrated Agri Lab, reducing the time required for analysis.

- Additionally, the InSight App facilitates communication between different stakeholders, such as input inspectors, RCCs, and IALs, which can lead to better coordination and faster resolution of any issues that may arise.
- Overall, the InSight App has enormous potential to improve the quality of agricultural inputs available in the market and help protect the interests of farmers.

Revolutionizing Agricultural Quality Control: The Future of Insight Up

- In order to ensure that only licensed products are sold in Andhra Pradesh markets, the OLMS system will be linked with the InSight App. Licensed manufacturers will be given a separate module in the app to upload their stocks offered for sale in Andhra Pradesh, along with the final destination of these products (dealer/distributor). Only licensed products will be allowed to be uploaded in this module. Products that do not have an entry in the InSight App will be treated as unapproved and issued a stop sale. This helps prevent the entry of unapproved products and companies into the market, and also helps control the entry of banned or misbranded lots/batches.

- By having manufacturers upload their stocks offered for sale in Andhra Pradesh in the InSight module with their final destination (dealer/distributor), the app is able to keep track of the presence of specific products and their batch numbers in each outlet. Based on past history and product testing results, the app assigns input inspectors to draw samples from these outlets. This ensures that the process is streamlined, transparent, and accountable.

- In addition, farmers will be given access to the InSight app, allowing them to verify the quality of a product before making a purchase by searching for the lot number/batch number. They can also search for various products offered by a company and their quality and availability in the InSight App. This helps farmers make informed decisions about their purchases and promotes transparency in the agricultural sector.

InSight

Quality Control App

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