



Transparent MSP Administration in Odisha using Geo-ICT

GeoSmart India 2022

November 15-17, Hyderabad

Food Supplies & Consumer Welfare Department

Govt. of Odisha

In association with

Odisha Space Application Centre (ORSAC)



Presentation Outline

- Introduction & background information
- The Project
- Project Impact

Introduction

Food Security is **The Largest Welfare Scheme (INR 2.56 lakh Crore)** of Government of India (Ministry of Food and Public Distribution)

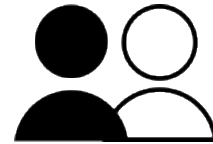
India's Food Security Mission



1.24 Cr.
No. of Farmers
benefitted by Govt.
of India's Paddy
Procurement in
2019-20



600.78 LMT
of Rice Procured
by Govt. of India in
2020-21



80.6 Cr.
Beneficiaries covered
under NFSA 2013, i.e.
99% of eligible
households under
Census 2011.



57.66%
growth in Rice
Procurement by Govt.
of India in KMS 2020-
21, as compared to
KMS 2016-17

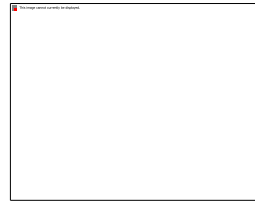
Paddy Procurement in Odisha



50k+ Villages



18.33 lakh
Registered Farmer



15.15 lakh
Farmers Sold Paddy



6.28 lakh MT Modern ,
Scientific Storage Capacity



152
RCMS Centers



2614
Primary Agriculture
Co-operative Societies



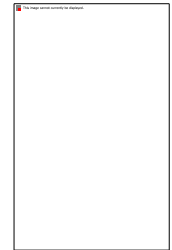
51.86
Lakh Total Verified
Land (in Acre)



1350+
Mills



200+
Certified Transport
Contractors



3.6 Crore
Beneficiaries



687
WSHG



84.15
Lakh MT
Paddy Surplus



13,781+
Crore Paid to farmers
24-48 hours



12100+
Fair Price Shops

Highlights of Odisha Paddy Procurement System

- Odisha is the **4th largest contributors** of rice to Central pool.
- Paddy procurement covered about **15.15 lakhs farmers**
- Current Value of Annual MSP expenditure **INR 13781+ Cr.**
- Farmer's intending to sell paddy register through a Web-based **Farmer Registration System** by a cut-off date, *providing* personal details, Bank details and plot wise land details
- Data gets **digitized by the procuring societies with Land records validation & Aadhaar authentication**

PADDY PROCUREMENT PROCESS FLOW



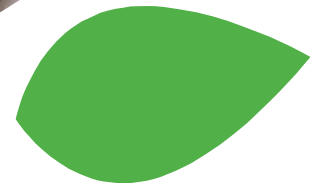
Challenges in Paddy Procurement

ISSUES	
Land Parcel Anomalies	Not all registered land parcels are cultivated. This leads to an exaggerated estimate for procurement of food grains.
Under-estimation of Produce	Due to incorrect assessment, procurement agencies tend to have a conservative procurement target, leading to distress sale of crop by farmers.
Fraudulent Procurement	Fraudulent elements get into the system by buying produce from small/ marginal farmers & posing as traders with registered land parcels.

INTELLIGENCE GAPS	
Gap between Registered data & ground realities	A major reason behind anomalies in regd. land parcels is the lack of authentication of field data.
Lack of Yield Analysis	Lack of analysis of the past yields and registration trends the targeted estimates can go seriously wrong
Validation Platform	Without technology, there is a Subjectiveness in validation of crops grown on farmlands

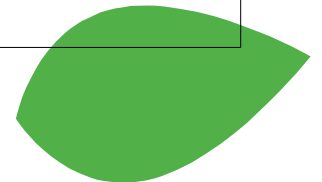
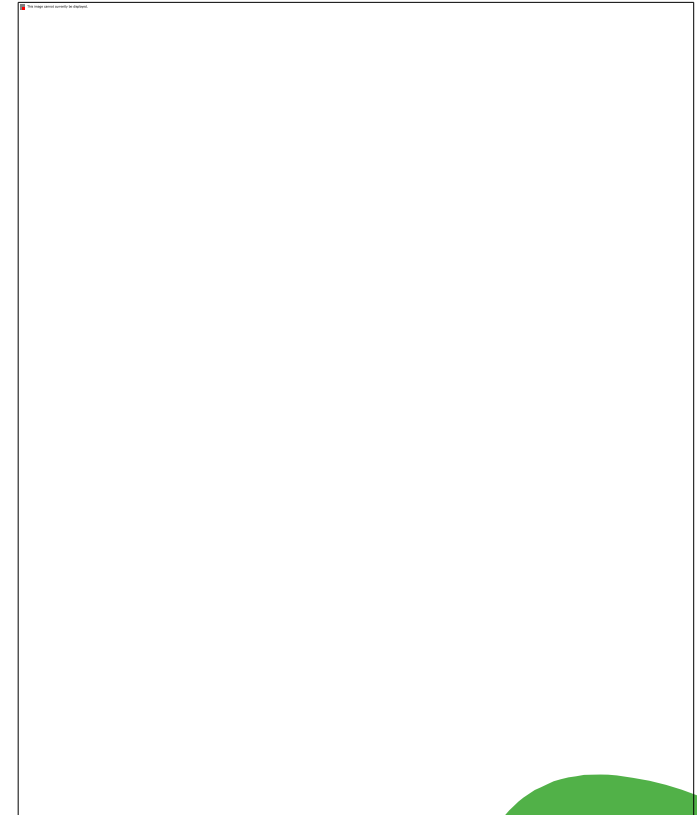
Project Background

- The demand to sell paddy under MSP scheme is growing by the day.
- It is therefore necessary to bring transparency in farmer registration and assess correct entitlement to sell paddy to Government under MSP.
- Crop areas claimed by farmers during farmer registration process needs to be validated at farmland level using high resolution satellite imagery of the crop period, to Ensure benefit of MSP reaching the genuine farmer.
- Data needs to be presented on WebGIS platform for better decision support.

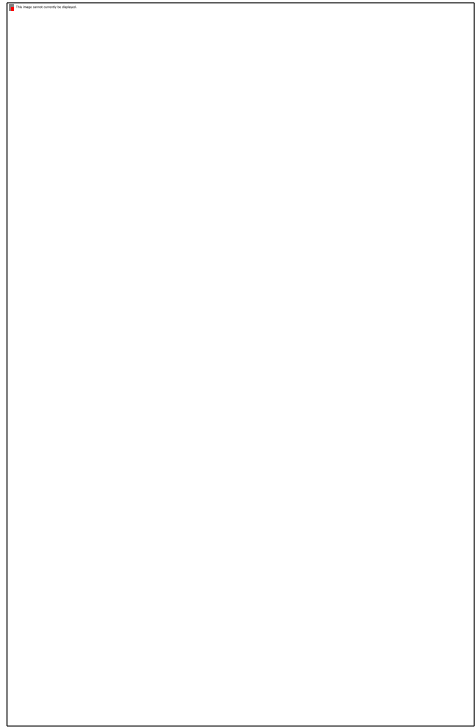


The Project

- The Food Supplies and Consumer Welfare Department, Odisha ensures the food support to the families below the poverty line by providing food grains and other essential items.
- The Department targets to put an end to false/ inflated claims in registration/procurement process and seeks to ensure MSP to genuine farmers.
- **The process of authentication of genuineness in farmer's reporting was implemented for Transparent MSP administration using GIS and High Resolution Temporal Satellite Images.**



The Process



Methodology



- Analysis of Kharif paddy reporting for past 3 years
 - New plots, area changes, new farmers,
- Identification of Croplands using HRSI (~ 1m)
- Updating existing digitized Cadastral maps, as per crop reporting, based on latest RoR data
- Mapping of village wise/ plot wise paddy crop reporting in cadastral maps using GIS
- Procurement of very high-resolution Planet 3m Mx image base maps (2 sets during crop period)
- Satellite image analysis for identification of paddy growth at farmland level.

GIS Mapping (cadastral) of Farmer Reporting



Paddy Reported Area On Satellite Image



Paddy Crop Classification using HRSI



HRSI (FCC) of Paddy growing area



Paddy Crop Classification

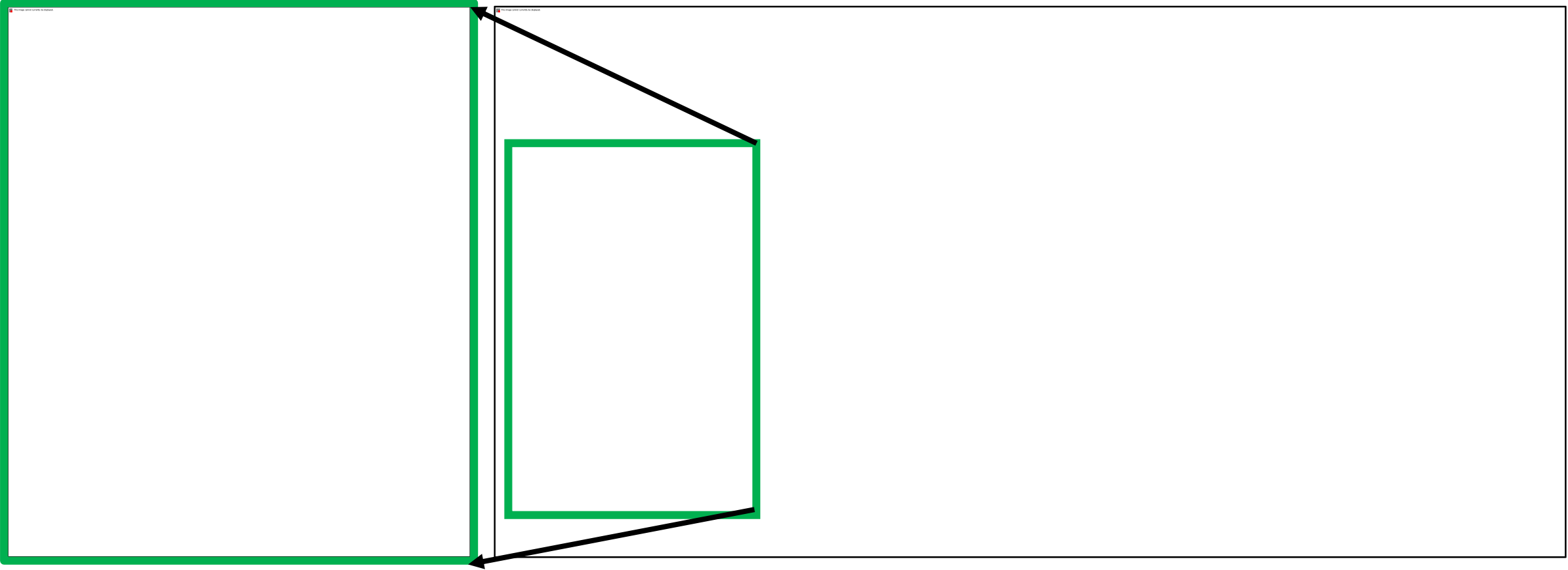


Methodology, contd..

- Integration of image derived paddy crop information with Cadastral reported paddy crops and identification of Suspects (false/ mis-reporting cases)

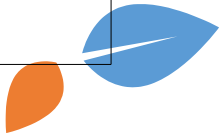


False/ Mis-reporting as per Image Analysis



False/ mis-reporting of Paddy Crop

No Paddy Part may have Paddy



Methodology, contd..

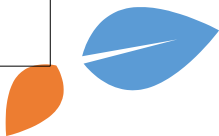


- Publication of suspect plot polygons in Geo ICT platform (Location based Web/Mobile GIS application)
- Navigation to suspect plots using Mobile app by PAC/SHG surveyors and validation of crop status with geo-tagged photos
- Integration with P-PAS system
 - Valid reporting is passed with correct quantity for issue of Tokens
 - Tokens are stopped for fraudulent reporting

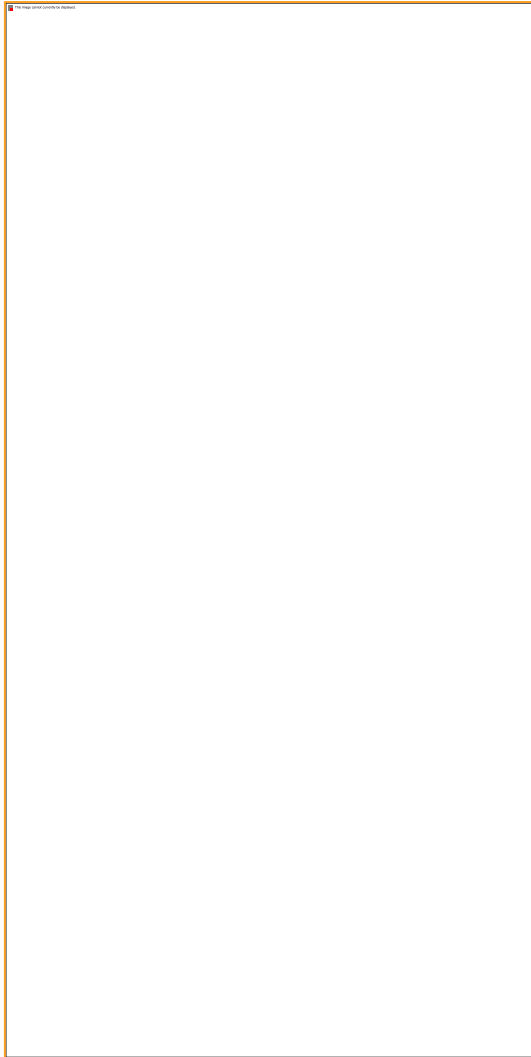
TECHNOLOGY PLATFORM FOR CROP ANALYSIS

- ❖ **Crop Monitor:** Land GIS is a visual window in the stack, offering unique visual control with filters using Hi-Resolution Satellite imagery, Valid/Invalid/Doubt Crop and geographical boundaries.
- ❖ **Land Monitor:** Land Monitor is a state-of-the-art MIS that tabulates and aggregates data from automated procurement system and field surveys conducted via the official through mobile-app.
- ❖ **Land Survey:** The Land Survey is a mobile attachment and front for Land Monitor and is used for land parcel surveys. The app works by accessing geo-location of both the land & the surveyor. Inbuilt compass feature ensures the survey can be completed only inside or adjacent to the geo-fence of the land parcel.
- ❖ **Analytics Dashboard:** Insightful analytics in the form of powerful reports provides direction for better decision making, pertaining to trend analysis, tracking anomalies & traceability of crops and so on. The analytics are in easy-to-consume which are easily generated in the app.

Web GIS based Crop Land Monitor with intelligent dashboard to analyse/ visualize season wise reported/ validated paddy crop data



Field Verification of Suspect Cases using Mobile App



Highlighted Features

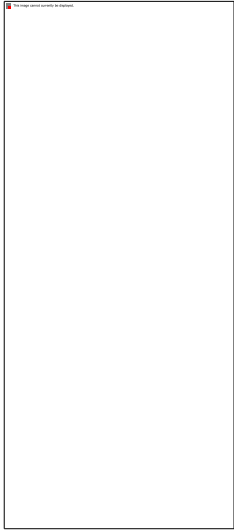
- **Face detection** while taking selfie of surveyor
- **Compass Navigation** in offline mode and google map navigation in online mode
- **Camera Compass integration along with geo fencing** to capture field photo of the targeted plot only

Targeted User

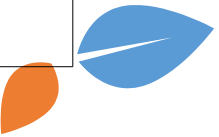
- Society members
- Society Secretary



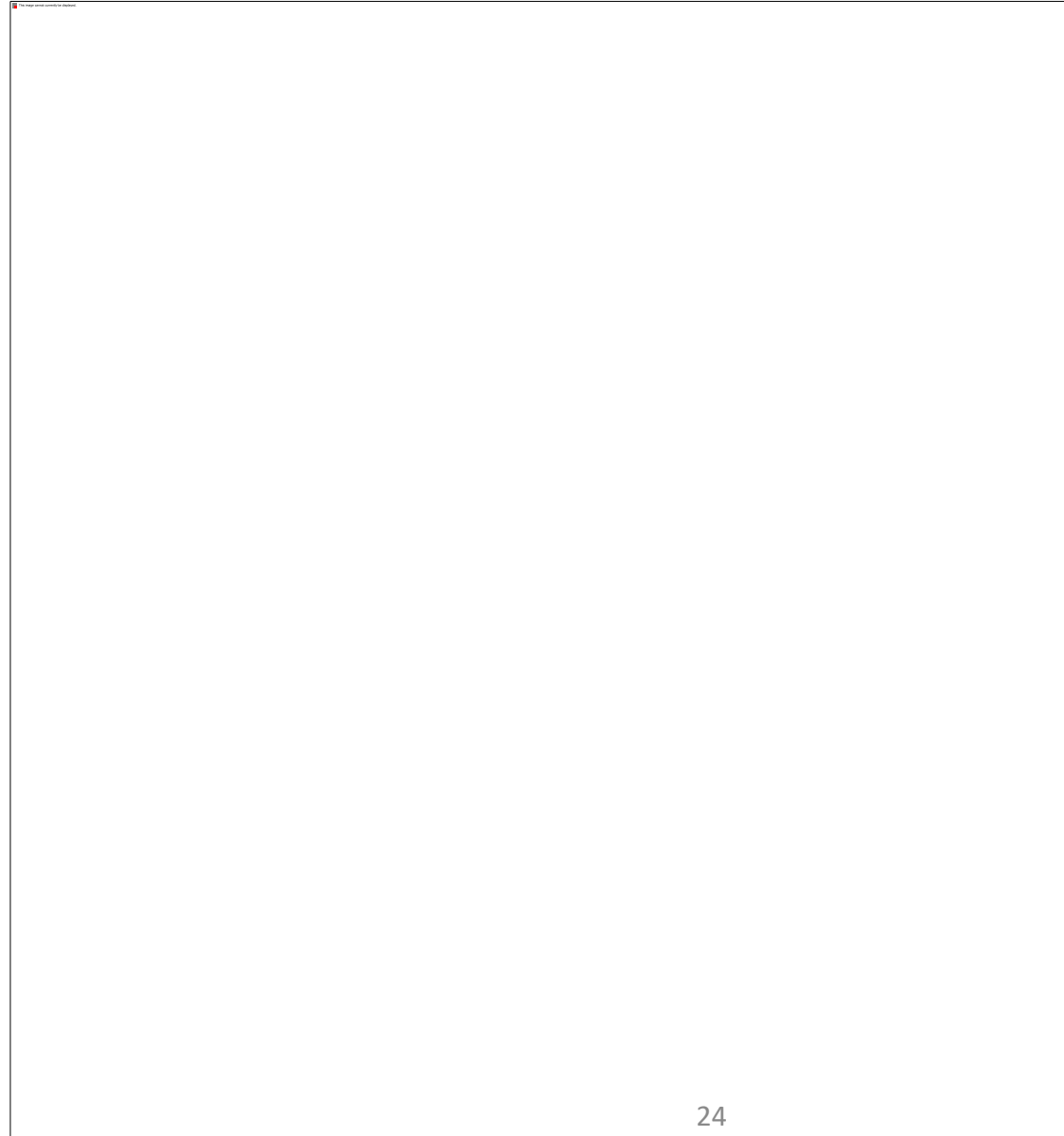
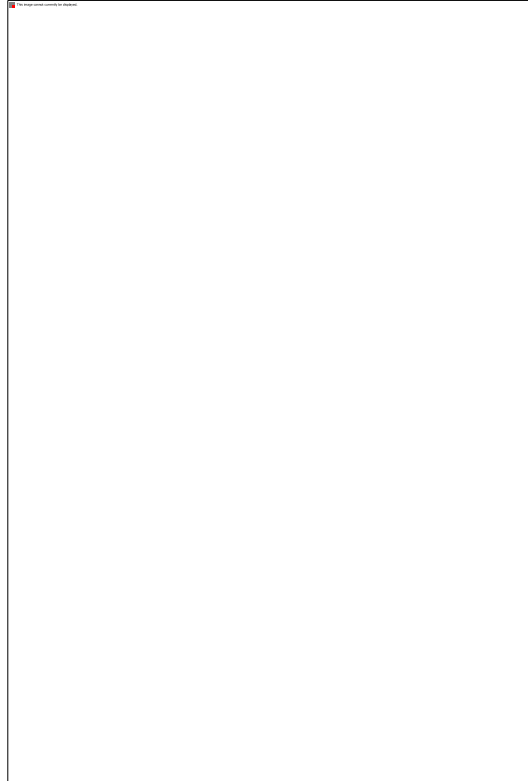
Crop Land Survey Mobile Application



Tracking of field validation

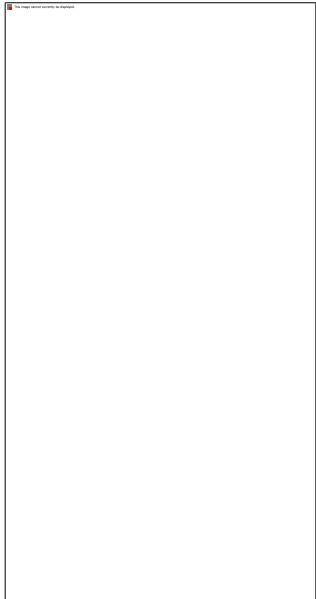


Field Validation Report



IEC ACTIVITIES IN PADDY PROCUREMENT

- ❖ *Call center* : to interact and register grievances of farmers.
- ❖ *Interactive Voice Response System (IVRS)*: farmers are able to know details relating to their verified land, exact quantum of paddy they can sell and payment of MSP by dialing from their registered mobile number.
- ❖ *SMS* issued to the registered farmers for selling their paddy at the designated mandi within the stipulated period. Reminder SMS *in 7 days*.
- ❖ *Pull SMS system* has been introduced through which the registered farmers from their registered mobile can fetch information on the quantity of paddy sold by them.
- ❖ Through *5T mantra* of Governance the entire paddy procurement operations have been transferred and it is being ensured that the small & marginal farmers also get benefited.



Impact / Benefits

	KHARIF (KMS 2021-22)	RABI (KMS 2021-22)
No. of Districts	7	17
Number of Tehsils	73	147
Number of Plots reported by farmers	2,578,248	2,53,539
Paddy area reported	1,804,808 ac.	1,44,177 ac.
Suspect Plots as per image analysis	1,02,300 nos	2,53,539 nos
Plots without paddy as per filed verification	83,076 nos	2,40,902 nos
Invalid reporting confirmed through verification	38,050 ac.	1,37,963 ac.
Estimated Quantity of False reporting	56,429 MT	3,37,425 MT
Estimated saving in MSP expenditure	Rs. 109.5 Cr	Rs. 654.6 Cr.



Growth in Participation of Small-Marginal & Share-croppers Post Implementation of Plot level validation of Paddy Crop using RS & GIS



Growth in Participation of Small-Marginal & Share Croppers in **Khariff KMS 2021-22 (7 districts)** post implementation of Plot level validation of Paddy Crop using RS & GIS

Growth in Participation of Small-Marginal & Share Croppers in **Rabi KMS 2021-22 (17 districts)** post implementation of Plot level validation of Paddy Crop using RS & GIS

IMPACT: Less Cost, Larger Coverage



Concluding Remarks

- ❖ Satellite Image based paddy crop validation has encouraged genuine farmers by eliminating fraudulent reporting.
- ❖ It has enhanced farmer participation, simultaneously saving about Rs.1000 Cr during KMS 2021-22
- ❖ It has resulted in better participation by Small, Marginal farmers as well as Women Self Help Groups (WSHGs)
 - ❖ KMS 2020-21: 421 WSHGs (earned 21.86 Cr.)
 - ❖ KMS 2021-22: 687 WSHGs (earned 28.50 Cr.)
- ❖ This unique Geo-ICT initiative has brought Transparency in MSP administration in Odisha



Thank You!!!