



Digital augmentation for building inclusive Rice-Agroecosystems in India

Advances in Geoinformatics, Big-Data and ICTs for Accelerated Pulses Intensification in Rice Fallows

> Platform for Big Data

in Agriculture

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Inter-CG Collaborations on Rice Fallow Characterization and Management in Odisha, Annual Workshop & Planning Meeting, 9 September 2019

Krishi Bhawan, Bhubaneswar.



International Center for Agricultural Research in the Dry Areas

GBD

GEOAGRO X R Google Earth Engine

A CGIAR Research Center CGIAR

CGIAR CSI

cgiar.org

GeoAgro, BigData & ICTs in Rice fallow intensification

Key developments

- 1. Mapping seasonal dynamics of rice paddy, rice fallows and rice fallow vegetation dynamics from 2000 onwards using Machine Learning and Google Earth Engine
- 2. Multi-sensors data fusion to map at different scales and improve accuracy of the maps and database
- 3. Developed ODK based Geotagging facility for e-Data collection and data aggregation for automate the classification
- 4. Developed trade off for RS based operationalization of rice fallow mapping
- 5. Integration of microwave data for overcoming clouds during peak growing season map the yield and related gaps
- 6. Mapping Lentil and Mung Bean suitability in rice fallows
- 7. Mapped rain water harvesting zones/site for supplemental irrigation for legumes in rice fallows during off-season
- 8. Developed geodatabase and web analytics- halfway towards building rice fallow information system for India

http://geoagro.icarda.org/intensification/







Quantification of Farming Systems @ multiple-scales

Smart Farming Platform





et al., 2015

End date of crop fallows

End of Fallow	
< <u>Mar</u>	Aug
May	Sep
Jun	Oct
Jul	Oct-Nov

1966

Some examples on ongoing efforts (GEE)



Quantifying the Dynamics of rice crops >> figure printing of the farms and typologies



Jamdigri-moved Jamdigri		Pakurseni LDTW Pakurseni LDTW		Hariharpur Hariharpur		Kalisara LDTW Kalisara LDTW		Kundra - IV PDW Kundra - IV PDW		Gosain Bundh SFMIS-moved Gosain Bundh SFMIS	
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Double cropped area

Single cropped area

Fingerprinting of the farming systems to make spatially informed decisions for timely actions

For example: use case of rice based systems for pulses

Sustainable intensification of the cereal-based systems



Sustainable intensification of the cereal-based systems: USE CASE

Real-time monitoring to target site specific interventions (package of practices)



Sustainable intensification of the cereal-based systems USE CASE

Real-time monitoring to target site specific interventions (package of practices)



Small farms field the world: food grown in small farms are more healthy, tasty, nutritious and it helps rebuilding living soils and resilient agroecosystems

GEE codes and real maps in to the http://geoagro.icarda.org/intensification/



Mapping Rice-fallow in Odisha



mapping moisture soil rice-fallow and **Real-time**





Sustainable intensification of the cereal-based systems



Real-time monitoring : Different scenario { West Bengal and Odisha}

Sustainable intensification of the cereal-based systems



icarda.org

Crop diversification in the cereal systems



Data driven multiscale informatics are required to build "inclusive agroecosystems" for growing food sustainable way for better world



Thank You ICARDA GeoAgro Team

-IPCC Confronting Climate Change: