



Building resilient agri-food system for sustainable future

AI & IoT for Inclusive Agro-Ecosystems for Sustainable Development



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Geospatial Opportunities in Inclusive Agro-ecosystems for Sustainable Foods and Future

Sustainable Food and Future



Increased land, water and system productivity while safe guarding the environmental flows and ecosystem services

- more crop per drop -water focus
- in a <u>inch of land</u> and a <u>bunch of crop</u> -multi dimensions -integrated systems

Knowledge based prioritization (space & time) for better strategy for investment, intervention, implementation and impact

Ecological intensification
Target specific interventions
Bridging the gaps
Inputs use efficiency
Agricultural policy
Halt degradation
Technology scaling

- food and nutritional security
- resilience and risk reduction
- agro-ecosystem sustainability
- adaption and mitigation
- citizen science and collective actions
- trade, social security and stability



Earth Observation Systems for Agro-Ecosystem Research

ACTIVE SATELLITE SENSORS AND CHARACTERSTICS

Medium resolution (5 - 30 m)

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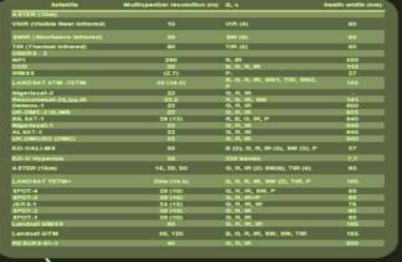
Very High Resolution	(Up to - 1	l m)
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High Resolution (1 to 5 m)

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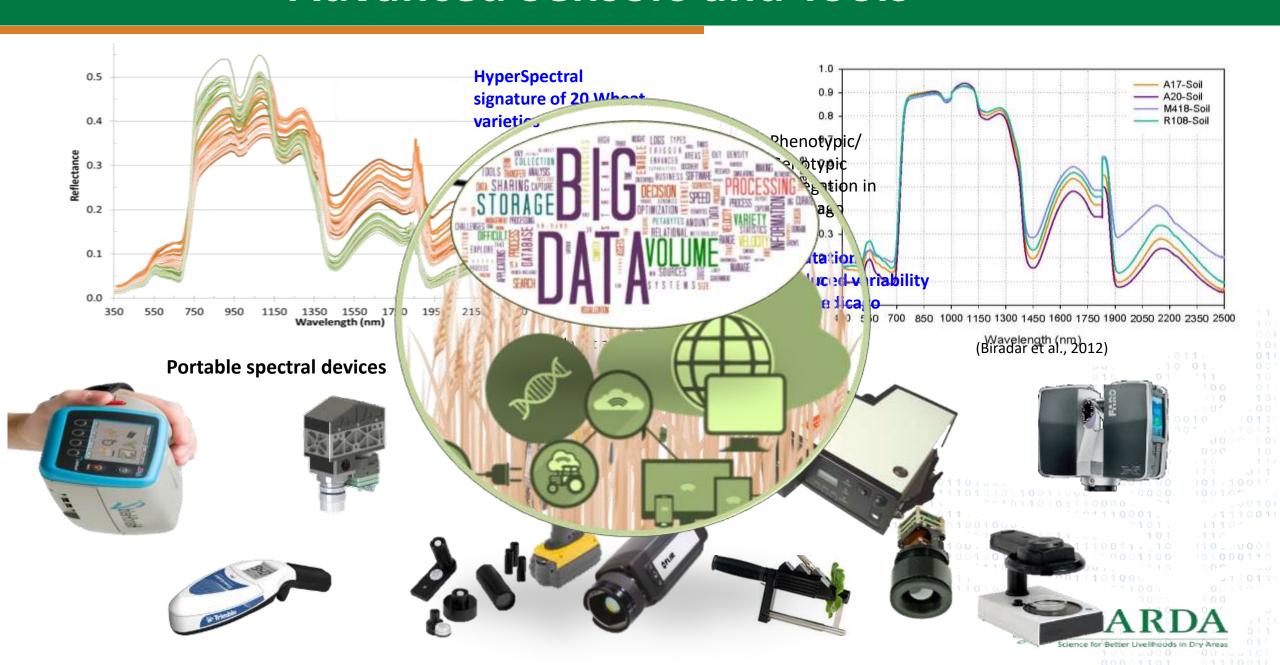
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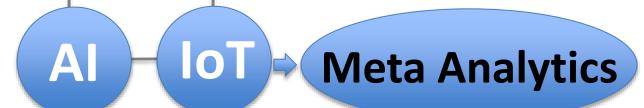


Advanced Sensors and Tools



Interoperability of Data for Better Decisions

Al @ genetics, chemistry, weather, agronomies, trade...



deep learning

predictive analytics

translation

classification & clustering

information extraction

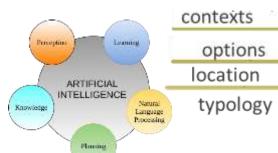


image recognition

machine vision

machine learning

natural language processing (NLP)

Demand driven Better options

expert systems

planning, scheduling & optimization

robotics

vision

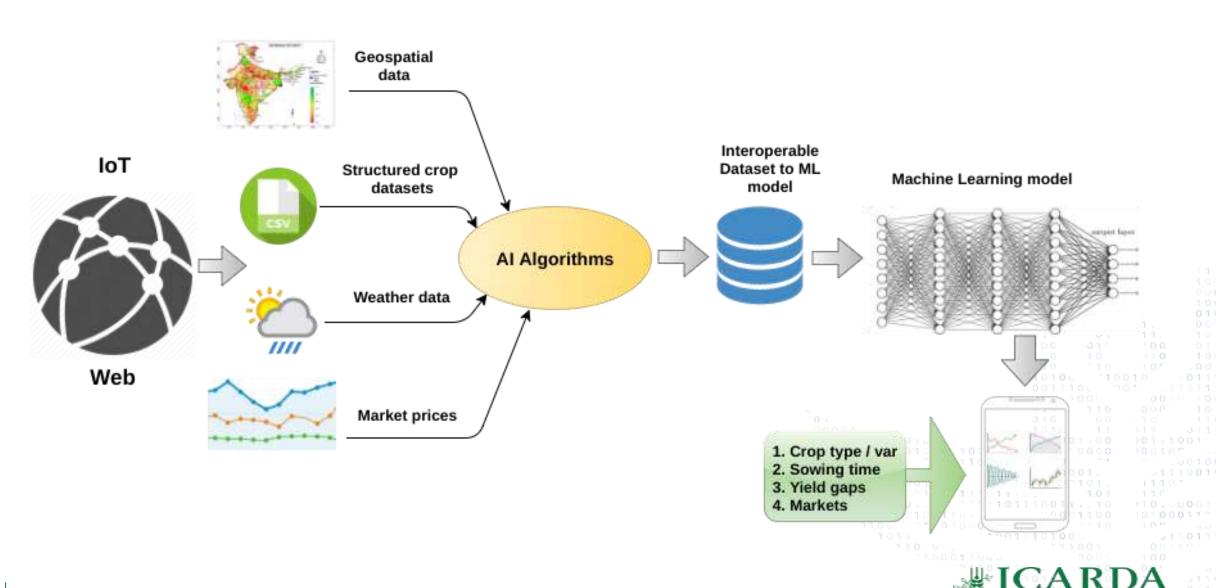


Inclusive Agroecosystems

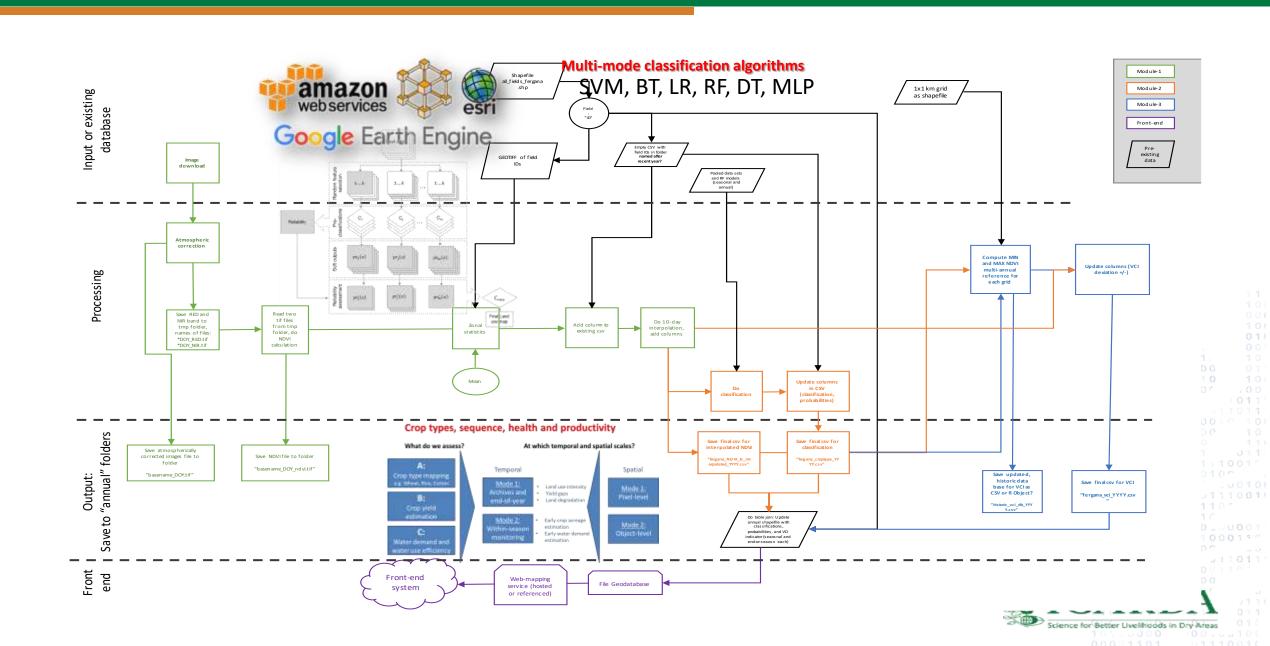


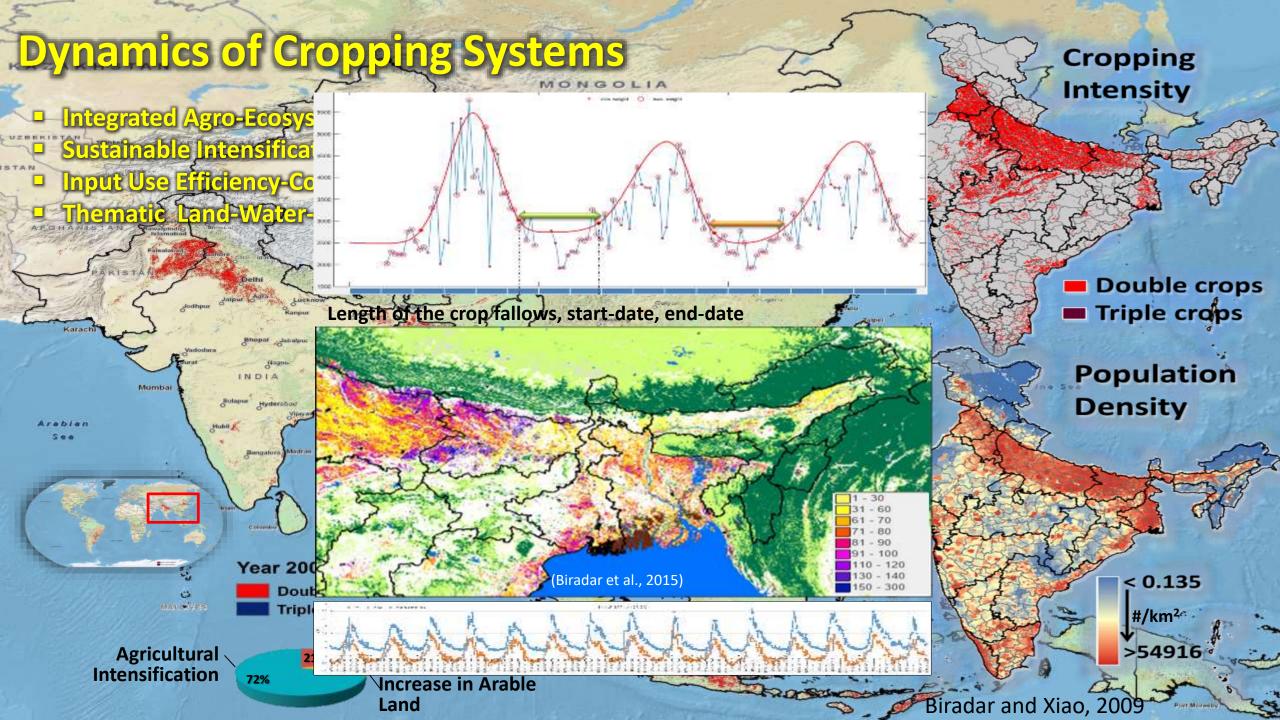


Big-data, Machine Learning and AI algorithms



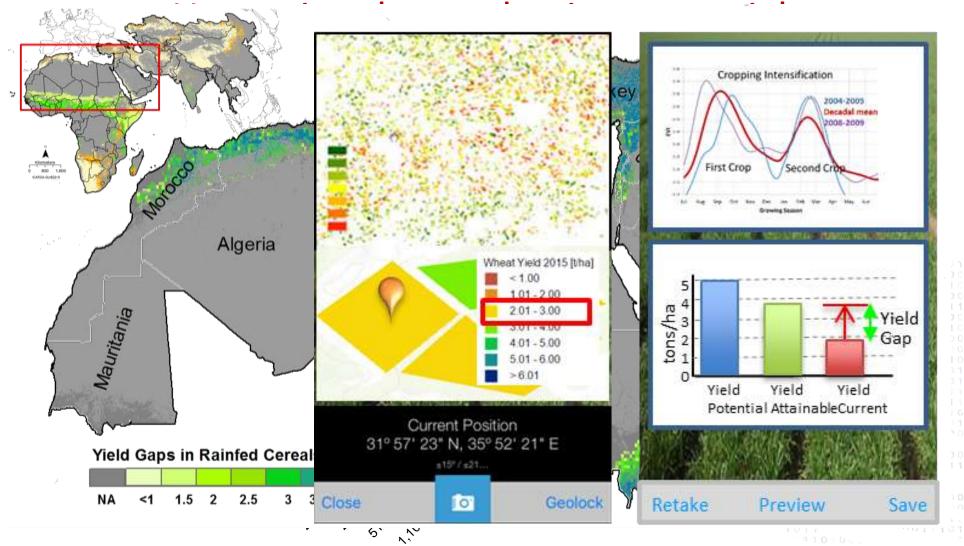
Big-data, Machine Learning and AI algorithms





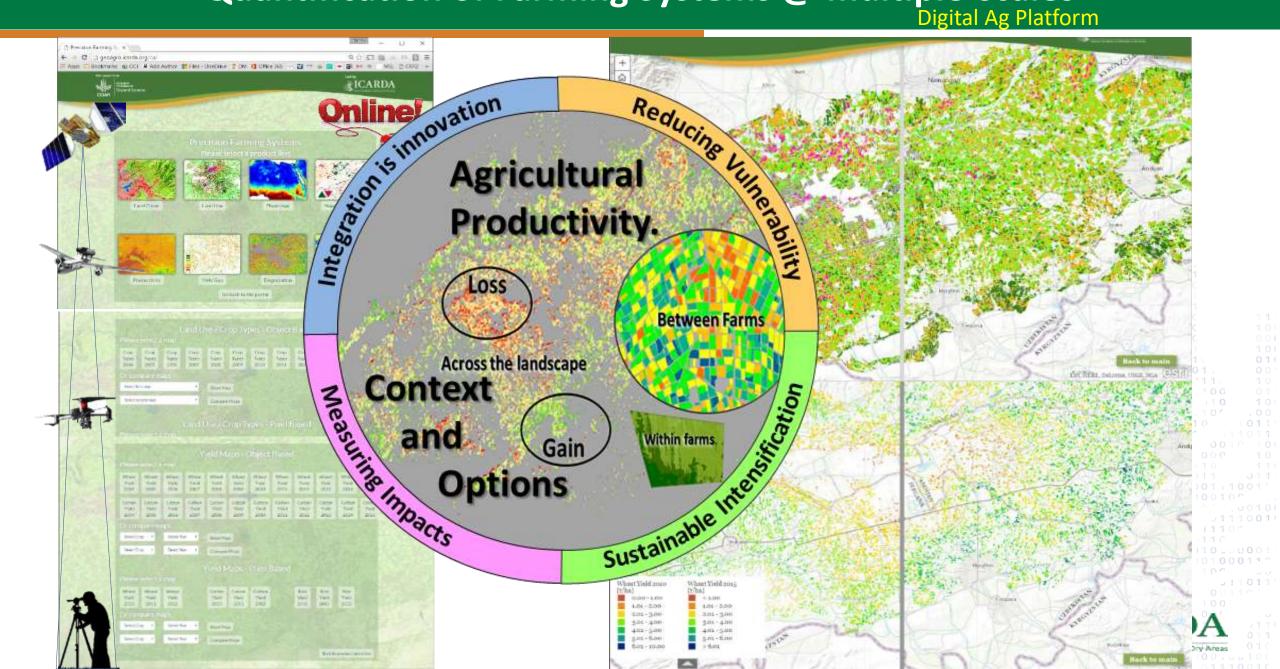
Bridging the Gaps @ multiple-scales

data, knowledge, productivity, resilience





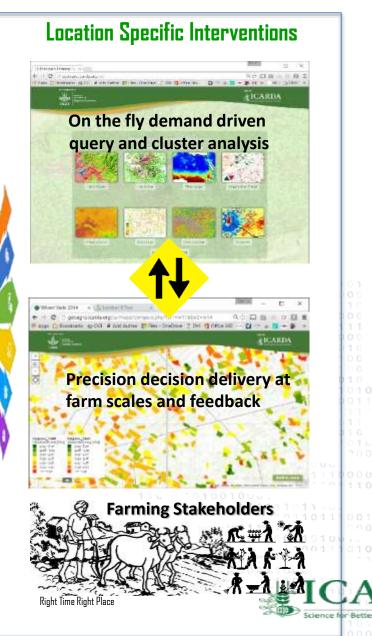
Quantification of Farming Systems @ multiple-scales



Digital Agriculture Platform

Image Based, Open Source Precision Decision at Farm scales





GeoAgro App:

Citizen Science Field Data Collection, Data Management, Precision Agriculture App for Tablets and Smart Phones





- Citizen Science
- Crop Type
- Crop Suitability
- Yield Forecasting
- Pest Risk
- Real-time Advisory

- Field Data
- Yield Gaps
- Droughts/floods
- Crop Stress
- Water use
- Real-time AET





in an inch of land and bunch of crop



Where much gain is expected?

Is that from genetic? 15-20 Is that from management? 50-60 Is that from socio-economy? 20-35

avoid the unmanageable and manage the unavoidable

-IPCC Confronting Climate Change:



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