EMERGING TECHNOLOGIES
ITE&C DEPARTMENT

AgTech Ecosystem in Telangana State, India - Accelerating emerging technologies for disruption

An Overview on Agriculture Data Exchange (ADEx)

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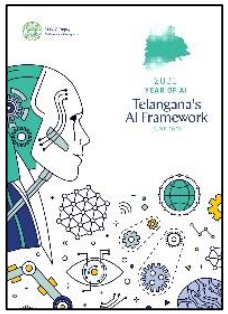
Agenda

- Context: Telangana's Vision of a Data Economy
- Agriculture Data Exchange (ADEx)
  - AgriTech use-cases: AI as the unifier
  - Approach for ADEx
- Digital Public Good for Data-Driven Policy with UNDP

The state's vision of data economy dates to 2016.

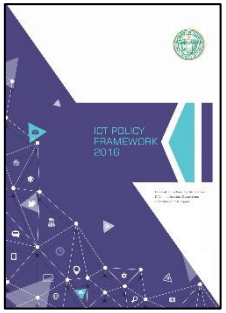
Official Open Data Policy for govt. data

AI Framework – Data Exchange Platform

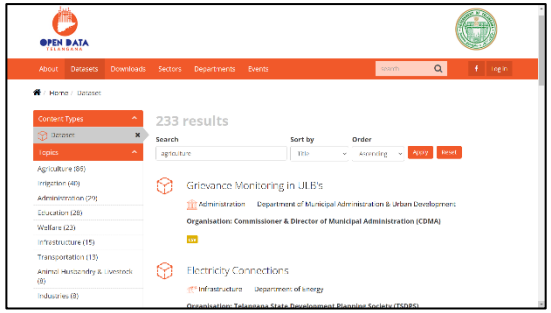


Agri Data Exchange (ADEx)

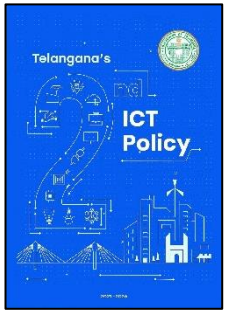
2016 | 2016 | 2017 | 2020 | 2021 | 2022 | 2023



1st ICT Policy – Included Open Data, AI, etc.



Launched Open Data Portal – Dedicated Team



2nd ICT Policy – Data Economy

Data Exchange (DEx)
- Agri
- Health
- Mobility
- Smart City

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The comprehensive mapping of the AgriTech landscape by the state government...

Landscape Review

- Research and Innovation Circle of Hyderabad (RICH) engaged the vibrant AgriTech community: tech businesses, startups, incubators etc. for compiling a list of available solutions.
- **83+** startups participated.
- **90+** emerging technology-based solutions were documented and screened.

Analysis and Segregation

Various solutions were identified across the crop cycle:

1. Crop Planning
2. Crop Protection
3. Irrigation Management
4. Nutrient Management
5. Farm Automation
6. Farm Advisory
7. Post Harvest Management
8. Crop Insurance and FinTech
9. Marketplace
10. Traceability

… and further deliberations under Saagu Baagu led to identification of 30 use-cases, most of which involve AI.

Intelligent Crop Planning

- Pre-season Forecast of Demand, Supply & Prices
- Macro Crop Planning @ National & State levels
- Dynamic Sowing Windows for major crops
- Plans for Priority crops (Import-substitution, High-value & High-Nutrition)
- Pre-season guidance to input suppliers, credit & Insurance

Smart Farming

- Rapid Soil Analysis & eSHC
- Pest Prediction & Control
- Controls on application of inputs
- Smart micro irrigation
- Drone-based application of fertilizers & pesticides
- Smart Insurance
- Smart FaaS
- Fintech
- Uberization
- eNWR
- Digital Extension
- Smart CCE, Yield Prediction

Farmgate to Fork

- AI, IoT-driven Smart Market
- Market Intelligence
- Farmer to Online Retail Network
- Hyper-local Connect (Farmer 2 Consumer)
- B2B Platform
- Aggregation
- Quality Assessment
- Traceability
- Smart Logistics (Domestic & Export markets)

Data Governance

- Agri Data Exchange
- Pilot on Agri Master Data
- Pilot on Agri Registries
- Pilot on Agri Directories

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The Agri Data Exchange (ADEx) is being conceptualized to unlock the AI innovation in agriculture and improve farmer's lives.

Why ADEx?

1. Agricultural **data is confined** to the enterprise that collects or generates it. Hence its potential value remains undiscovered.
2. There is **no structured way of sharing** the agricultural information, much less in an automated and rights-protected manner.
3. **Accessing** agricultural data for innovation is deterrent because of the **tedium, cost, effort and time taken**.
4. There is **no single point of reference** to get data required from multiple sources for creating integrated and innovative services.

Objectives of ADEx

1. To **connect** the providers and consumers agricultural information in a consent-based and secure manner.
2. To provide for efficient **discovery** of agricultural data required for innovation & research
3. To convert 1-1 data transfers to N2N data exchange, and thereby create a **force multiplier** effect.
4. To accelerate the evolution of the national digital agriculture ecosystem through open standards, open protocols and open APIs in **data management**.
5. To help intensify the use of **emerging technologies** through ease of accessing data.
6. To provide safeguards for **protection** of personal data
7. To enable the data providers to specify the terms and conditions for **sharing** of data and the purpose and period for which the data can be used by the consumer.
8. To establish **transparency** in all processes relating to data exchange.
9. To establish mechanisms for addressing **grievances** and complaints of the users

To have a user-driven thought process, certain priority use-cases have been identified...

Description of the Use case	Specificity	Data-driven	Data-intensive	Value addition	Potential Demand	Status of database	Scope for 4IR Tech / Innovation	Overall Rating	
1. Weather & soil-based advisories on sowing	○	●	●	○	○	○	●	74 %	
2. Hyper-local weather & soil-based sowing advisories	●	●	●	○	○	○	●	80%	
3. Weather & soil-based advisories on pest prediction/mitigation	●	●	●	●	●	○	●	92%	2
4. Hyperlocal weather & soil-based advisories on crop health mgt	●	●	●	●	●	○	●	92%	2
5. Soil health management, e-Soil Health Reports	●	●	●	●	●	●	●	100%	1
6. Precision agriculture - Prescription-based application of inputs	●	●	○	●	○	○	●	80%	
7. Uberized farm machinery services	●	●	○	○	○	○	○	68%	
8. Traceability for export products and organic produce	●	●	●	●	○	●	●	92%	2
9. Quality testing for pricing, consumer assurance	●	○	○	●	●	○	●	80%	
10. Crop area estimation	○	●	●	○	○	○	○	68%	
11. Yield estimation	○	●	●		●	○	●	80%	
12. Hyper-local connect (farmer-to-consumer)	●	●	●	●	●	○	○	86%	3
13. Smart Insurance	●	●	○	○	●	●	●	86%	3
14. Smart credit	●	●	○	○	●	●	○	80%	

The above use cases have been filtered out of the IDEA and AI4AI initiatives

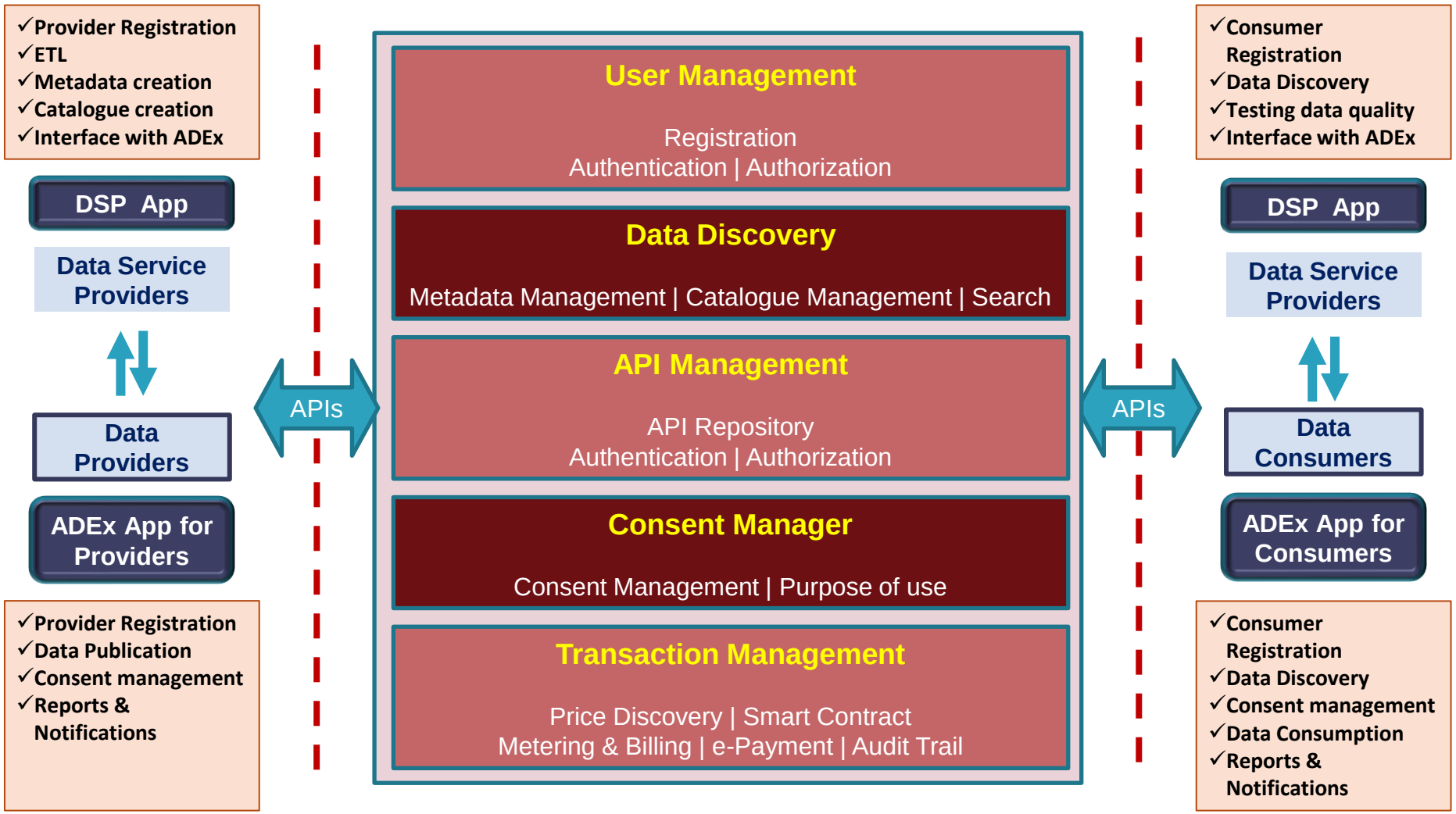
= 14% =8%

… and have been mapped with key data-sets to understand the challenges holistically.

Hyperlocal Weather Advisory	
Farmers	✓ Farmer Information –Name, Age, Address ✓ Identify proof ✓ Address Proof
Land	✓ KhasraNumber ✓ Location –Geo tagged
Weather and Geo Spatial Data	✓ Time series data on weather ✓ Precipitation ✓ Temperature ✓ Humidity
Ground Data	✓ Crop sown ✓ Soil Health, through sensors ✓ Productivity Data, trends for particular crop ✓ Major Pests and diseases in particular geography

Pest Management	
Farmers	✓ Farmer Information –Name, Age, Address ✓ Identify proof ✓ Address Proof
Land	✓ KhasraNumber ✓ Location –Geo tagged ✓ Size
Crop Data	✓ Area under cultivation ✓ Crop sown ✓ Variety
Weather and Satellite Data	✓ Satellite Imagery for crop stage ✓ Weather Data
Ground Data	✓ Soil Data
Pest Data	✓ Pest Image ✓ Previous Pests History for library

With discussions in working groups anchored by WEF, the functional Architecture of ADEx Ecosystem is mostly ready.



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GoTS has partnered with UNDP to jointly initiate the NextGenGov 'Data for Policy' initiative on Food Systems.

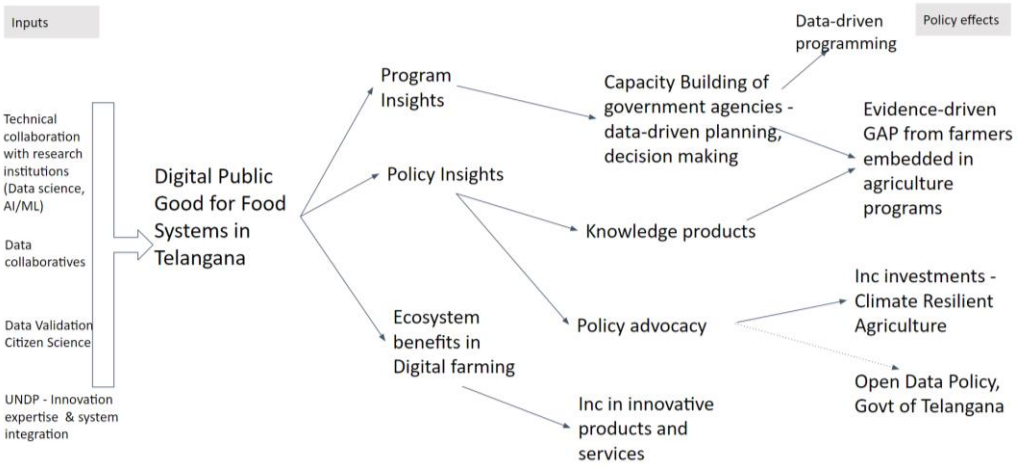
Partnership

To actively promote strategies such as

- Anticipatory governance, Policy experimentation,
- Community-centric design, digital public goods, open innovation,
- Capture transformative effects created by emerging technology innovations
- Facilitate knowledge exchanges and multidisciplinary research collaborations through national, regional and global networks, for smarter and sustainable food systems.

Activities

Data-driven journey for Policy-making



Digital Public Good
(Web platform)

Knowledge Products
(Field stories, Farmer videos)

Data Collaboratives
(Partnership agreements, SOP for Data Collaborative)

Data Validation
(Training to volunteers, Mobile Application)

Program & Policy Insights
(Newsletters)

Capacity building
(Training Video, Reports, etc.)

Policy Advocacy
(Opeds, Blogs, National Summit)

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Thank You!

We believe that technology is an enabler that can transform lives

…

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