Harvesting and FAO e-Agriculture Webinar

Driving Financial Inclusion for Smallholder Farmers using Satellite Data and Machine Learning

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Harvesting, Inc

Julie Cheng
Director, Financial Inclusion

Overview

Harvesting

500 million smallholder farmers in the world

- Represent **~2 billion** people
- Provide **80%** of food in developing countries
- Need **USD 400 billion** in credit
- Only **7%** have access to financing

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Why finance SHF?

- Access to credit allow farmers to buy improved inputs like **quality fertilizers and certified seeds, and assets like micro-irrigation**
- Improved inputs can **increase farmer yields, and incomes (by 80-140%).**
- By 2050, world will need to feed 9 billion people, **70% more food** than today

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The Problem

Smallholder farmer communities are amongst the most underserved in the world with **little to no access to:**

- Finance
- Inputs
- Market

Lack of access due to:

Information Asymmetry in Global Agriculture

The Challenge: how to get info on SHFs?

- Lack of integration into the formal sector → no financial data, utility payments, social media footprints
- Widely dispersed in remote or difficult to reach geographies → difficult and costly to gather data
- Need skilled credit officers, trained in agriculture lending

The Solution: satellite data and deep data analytics

Cost-effective, accurate, timely way to identify, measure and predict farmland activity

- High performance computing infrastructure: >10K CPUs processing data in parallel

- Analytics: ability to process petabytes of satellite data from NASA & ESA → actionable info on farmland activity that lenders can use to assess farmland performance

    - Number of crops
    - Historical harvesting dates
    - Future Harvesting Date
    - Soil Moisture
    - And more

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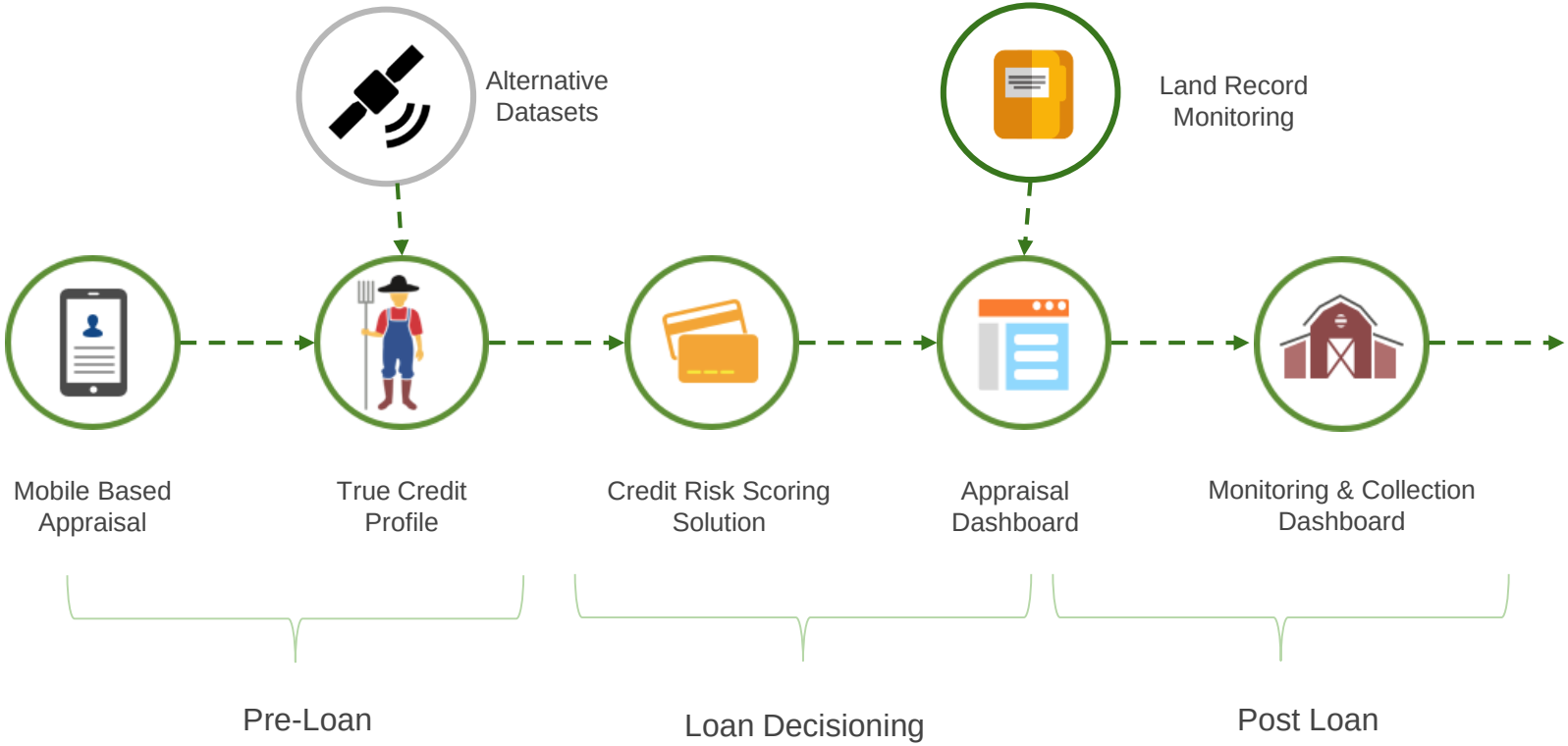
Aparna R. Phalke
Remote Sensing Scientist and Product Manager

Brief Introduction to Harvesting's AgIntel Engine

Harvesting's Agri-Lending Suite



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Introducing the Harvesting AgIntel model for farmer financing

Through our Agricultural Intelligence (AgIntel) Engine, we use satellite data and machine learning to help financial institutions make and manage loans to farmers

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Harvesting's Super Computing Machine

11,000 CPUs Billions of data points Millions of acres

Data Collection (Satellite data + ancillary data) → Data Cleaning → Data Processing (Machine Learning Models) → Data Storage → Data APIs → End Solutions

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Use Cases

- ❏ Agriculture Lending
- ❏ Crop Insurance
- ❏ Farmer alert & value added services
- ❏ Farm management
- ❏ Precision Agriculture
- ❏ Planning and policy
- ❏ Scientific community

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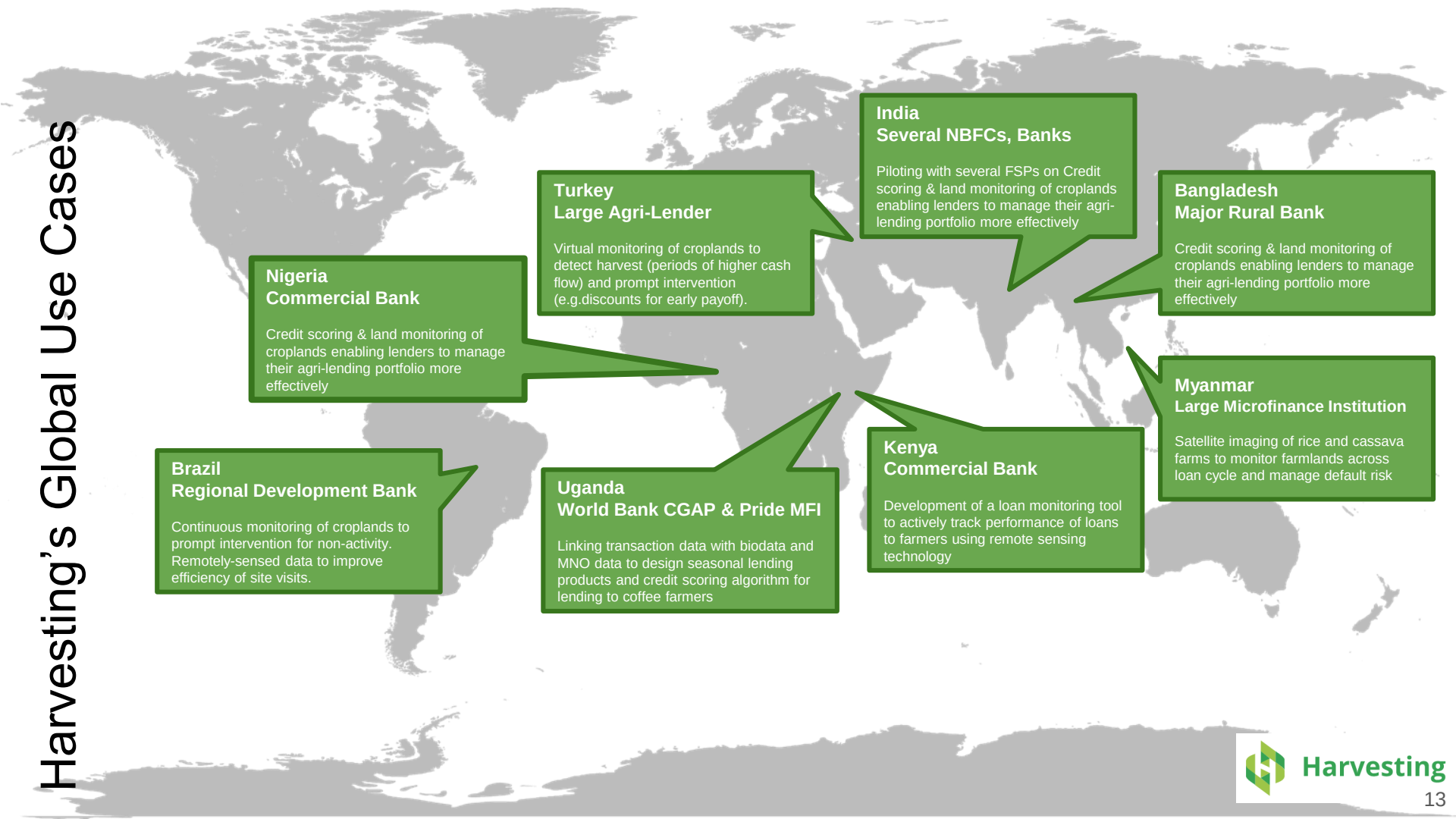
Harvesting's Global Use Cases



India
Several NBFCs, Banks

Piloting with several FSPs on Credit scoring & land monitoring of croplands enabling lenders to manage their agri-lending portfolio more effectively

Turkey
Large Agri-Lender

Virtual monitoring of croplands to detect harvest (periods of higher cash flow) and prompt intervention (e.g.discounts for early payoff).

Bangladesh
Major Rural Bank

Credit scoring & land monitoring of croplands enabling lenders to manage their agri-lending portfolio more effectively

Nigeria
Commercial Bank

Credit scoring & land monitoring of croplands enabling lenders to manage their agri-lending portfolio more effectively

Myanmar
Large Microfinance Institution

Satellite imaging of rice and cassava farms to monitor farmlands across loan cycle and manage default risk

Brazil
Regional Development Bank

Continuous monitoring of croplands to prompt intervention for non-activity. Remotely-sensed data to improve efficiency of site visits.

Uganda
World Bank CGAP & Pride MFI

Linking transaction data with biodata and MNO data to design seasonal lending products and credit scoring algorithm for lending to coffee farmers

Kenya
Commercial Bank

Development of a loan monitoring tool to actively track performance of loans to farmers using remote sensing technology

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Demo for Following Features using APIs

Field bio-physical parameters

Field size / Elevation / Slope / Administrative information / Feature distance to closest primary road and city

Field crop-growth parameters

Planting dates / Harvesting dates / Field activity status / Future harvesting date

Field crop-thematic parameters

Crop type / Crop yield / Crop intensity

Picture credits: Aparna Phalke
Courtesy: Livelihood in Sataroad village in Satara District, Maharashtra,India.

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Stefan Suess
Remote Sensing Scientist

Harvesting AgIntel Demo

THANK YOU!

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