ICT Tools for Sustainable Agriculture

Full Visibility of Agriculture Value Chain

ESE™ Agri
Empowering and making smallholder farmer more productive is paramount important to address the global issues of food security and food safety and achieve sustainable agriculture.
Mobile Technologies

No Technology has made such a profound impact in such a short span of time as mobile technologies have done to human beings

*Especially to the people at the bottom of the pyramid*
Our Journey so far ...

Impacted more than

500K

FARMERS

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COUNTRIES
About SourceTrace – Our Investors

- Gray Matters Capital
- Soros Economic Development Fund
- Serious Change LP
- Impact Assets
- The Schmidt Family Foundation
- Sorenson Impact Foundation
Benefits of SourceTrace Solution

- Provides full visibility all the way to the first mile of Agriculture Value Chain where smallholder farmer plays a paramount important role

- Enable Farmer Organizations, Agribusinesses, Government and Non-Government agencies working with large number of smallholder farmers make better informed decisions and improve overall operational efficiency

- Enable smallholder farmers to participate in the global commerce – bring equity to the agriculture value chain and earn their due share & fair prices for their produce
ICT Modules for Digitizing Agri Value Chain

Pre Farm Gate

- Farmer Enrollment
- Pre-Planting
- Farm Distribution Management
- Crop Area Mapping
- Crop Activity Calendar
- Pest and Disease Monitoring
- Crop Harvest
- Cost of Cultivation
- Geo-tagging of Farm
- Sowing
- Farmer Account Management
- Yield Estimation
- Crop/Farm Inspection
- Certification
- Crop Sale

Post Farm Gate

- Procurement
- Product Transfer Tracking
- Processing Plant Monitoring
- Retail Sales Management
- Payment Management
- Warehouse Stock Management
- Product Sales Management
- Traceability
— Add-on Modules

- Monitoring and Evaluation
- Advisory Services
- Social Economic Survey
- Weather Information
- Dashboard Charts and Reports
- Market Linkage
- Sensitizing
- Training

SourceTrace

ESE™ AGRI
Mobile Application
ICT Modules for Agriculture value chain - Pre Farm Gate

**Farmer & farm enrollment** is the first and important module in the value chain:

- Farmer and farm data are collected and the profile is created in the centralized database.

- Profile data can be basic information about the farmer to a complete profile fully compliant with most of the standards such as Fairtrade, Organic, UTZ and Rainforest Alliance.

- Geo-referenced farm data including the plot area and perimeter is also captured with the mobile application.
ICT Modules for Agriculture value chain - Pre Farm Gate

Farmers Inclusion and Biometric Capture

- Biometric helps in authenticity of data
- Prevents duplicity
- Helps in fair and transparent financial transaction and financial inclusion
— Modules Using Remote Sensing Technology

- Weather Based Advisory Services for
  - Pest and Disease monitoring and diagnostic
  - Crop advisory services
- Weather Forecasting
- Rainfall, wind and cloud cover analysis for crop production, yield analysis And pest and disease occurrence forecasting
- Soil Moisture determination for Efficient fertilizer application and management
- Plant canopy management
- Vegetation, forestry and plantation mapping
- Mapping Irrigation and other water bodies
- Drought prediction
- Cyclone and other early weather warning systems, used for agriculture and aquaculture
- And various customized weather solution for crop production
Weather based Crop Advisory Services

- Automated advisory services on Pest and disease, crop production, market price fluctuation
- SourceTrace advisory services helps in reduction of risk associated with agriculture, horticulture, fisheries and other allied sectors and empowers farmers and promote livelihood
- Data generated through SourceTrace remote sensing based technology is used to forecast weather
- Two way communication can be established with farmers using SMS messages for providing advisory and extensions services to farmers
- Automation of advisory message based on the forecasted weather directly to farmers mobile through SourceTrace Technology
Snap Shots
Data and Results

Regional Climate Forecasts

NDVI Images for India (Week of Dec. 19, 2017)

NDVI Images for India (Week of Dec. 27, 2017)
ICT Modules for Agriculture value chain - Post Farm Gate

**Internal Control System & Certification**

Enables farmer organizations to create and maintain a digital Internal Control System (ICS) for the certification process:

- Ready to use certification templates for UTZ, Organic, Fairtrade, BAP etc.
- Farm area calculation and geo-reference data to comply with the latest UTZ and other standards
- Collect data directly from the field saving time and increasing data integrity
- Geo referenced data and pictures of the farm for source traceability
- Keep track of certification premiums
ICT Modules for Agriculture value chain - Post Farm Gate

Internal Control System & Certification - Process flow
Digital Supply Chain Module

- SourceTrace Digital supply chain integrates and connects the movement of the produce from the farm gate to the warehouse.
- Through SourceTrace traceability solution the supplier type, source, geo location is determined.
- The procurement from various farmers organisation, FPO, FG, are mapped along with the place of procurement.
- The system has multiple procurement options and in built ready to print label on the produce for enhanced traceability.
- SourceTrace Procurement modules readily adopts of the various forms of procurement and units available.
- The procurement modules integrates with the farmers enrolment module, product transfer module and ware house module for traceability.
- The entire transaction done in the systems real time basis and ready report available on the web server.
Traceability is an increasingly common element of public and private systems for monitoring compliance with quality, environmental, and other product and/or process attributes related to food. Traceability is therefore becoming a pre-requisite to establish safety of food products.

SourceTrace has built-in traceability capability in ESE™ Software

- Unique ID generation of farmer, farms, and location
- Generation of batch/labels of produce with Bar/QR codes
- Capturing the produce movement till the processing plant
- Generate Bar/QR code based traceability system till the consumer point
- Internationally accepted numbering system can be followed for traceability systems
- GS1 or any other standard registration can be integrated
- Printable traceability label/QR code can be generated
Traceability Process

1. Farmer, Farm, Harvest
   - Unique ID code generated while recording data.
   - The data attributes to be captured include:
     1. Geo Location
     2. Farmer, Farm, and Crop information
     3. Certifications
     4. Contact details
     5. Registration Number

2. Collection Centre
   - Record produce details and other informations like farmer name, variety, date, area and quantity

3. Packing
   - Labelling of Producer No., ID and other details
   - Weighing

4. Transportation
   - Logistic Details
   - Transport Management

Diagram:
- Farmer, Farm, Harvest (1)
- Collection Centre (2)
- Packing (3)
- Transportation (4)
- Processing Plant
- Transport
- Retail Outlet
- Customer
- Database Server
- SourceTrace mobile application or Handy Scanner
- Bar/QR Code
- Data linked to the Central Database Server
## eServices Everywhere (ESE™) Platform

<table>
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<tr>
<th>Captures</th>
<th>Integrates</th>
<th>Real time updates</th>
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<td>Photos, GPS, Bar/QR code, Biometric Digital Sig.</td>
<td>ERP &amp; SAP (for inventory, supply chain and etc.,)</td>
<td>Transactions</td>
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<td>Core Banking systems</td>
<td>Analytical Reports</td>
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### Supports
- Mobile Printer (for receipt issuance in the field)
- Digital Scale (bluetooth connectivity)

### Innovative Architecture
- Optimized for different environments
- SaaS based Android mobile and web application

### Operates
- Online
- High bandwidth
- Offline
- Low bandwidth
ESE™ Software Data Analytics

- Dashboards & Reports
  - Geo reference of Farmers
  - Real-time charts and dashboard
  - Built in Real time Reports
  - Advanced analytics & graphs
ESE™ Agri GIS Features

- Field staff tracking
- Farm plot mapping
- Nearby farms
- Infrastructure mapping
- Yield mapping
Benefits to Farmer

- Complete Digitization of Agriculture value chain
- Connecting smallholder farmers to global market
- Supports sustainable and empowerment programs
- Innovative approach towards smallholder farmer digital inclusion
- Improves the advisory services to the farmers
- Provides latest ICT tools to farmers for their benefits
- Faster communication with farmers
- Connect to farmers located remote areas & hilly terrance
- Less time to process transactions and data
- Faster and efficient payments to farmers
- Improve efficiency, transparency, accountability and monitoring of the value chain
Thank You