Grameen Intel Social Business Ltd.

ICT for Agricultural Extension and Advisory Services

On the example of GISB eAgriculture Solutions

August, 2016

Who we are: Grameen Intel Social Business Ltd. ICT solutions for the world's social problems

- Founded by Intel Capital and Grameen Trust
- Developing technology solutions to improve livelihood at the base of the pyramid
- Partnering with Govts and NGOs to enable the use of ICT in agricultural programs
- Goal: Scale social impact through a self sustaining business model - a Social Business
- Performance measures: solution penetration, social benefit/impact and cost recovery

Grameen Bank ranks 12th on the Fortune's first ever "Change the World List" of top 50 global companies

1 vodafone
2 Google
3 TOYOTA
4 Walmart
5 Enel
6 gsk
7 JAIN Jain Irrigation Systems Ltd.
8 CISCO
9 NOVARTIS
10 facebook
11 MasterCard
12 Grameen Bank
13 Alibaba Group 阿里巴巴集团
14 DANONE

Source: Grameen-Intel Social Business

ICT empowered extension enables access to agriculture expert know how and best practices on a grassroots level

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Challenges of smallholder farming

- Low efficiency of traditional, rain-fed farming practices
- Live-threatening risk of harvest loss due to pests, diseases and weather
- Lack of market transparency (prices, demand for crops, etc.)
- Agriculture practices highly regional and crop specific

Impact of ICT to agriculture extension

- Higher yield and lower input cost through tailored recommendations
- Risk management through access to agricultural expertise and information
- Connect farmers with market: Crop decision, price transparency
- Localization of tools and agriculture recommendations to local conditions

Source: Grameen-Intel Social Business

Mobile solutions driving sustainable impact to farming efficiency, livelihood and job creation at the BoP

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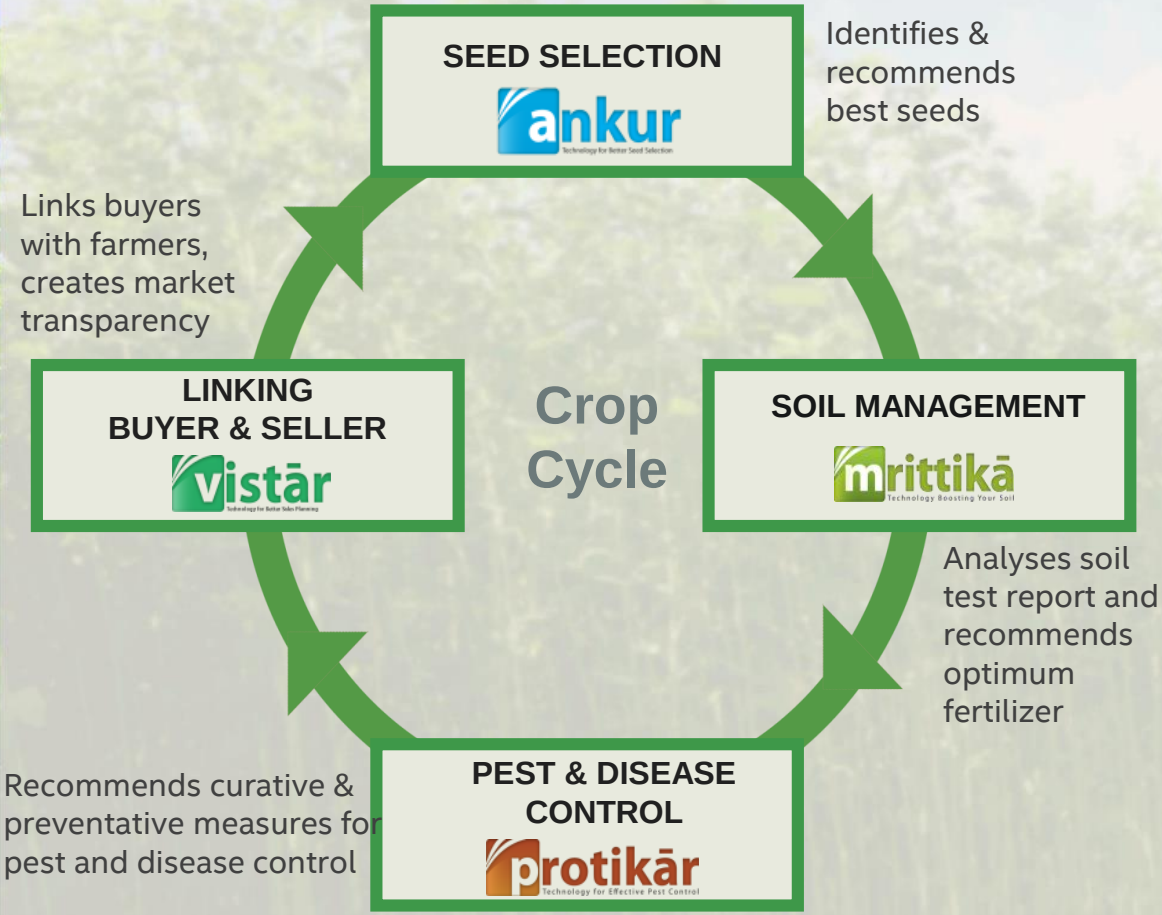


GISB eAgriculture for ag extensions

- **Empower agriculture extension** programs
- **Create rural jobs** and income for micro entrepreneurs
- **Improved, sustainable livelihood** of small-holder farmers through increased yield (up to ~30%)
- Drive **food security** & **reduce environmental impact**
- **New insights and small business opportunities** along agriculture value chain through data & analytics
- Support **ICT capacity building in rural areas**

For further details, please contact Dilek Altin: dilek.altin@intel.com

mritikka

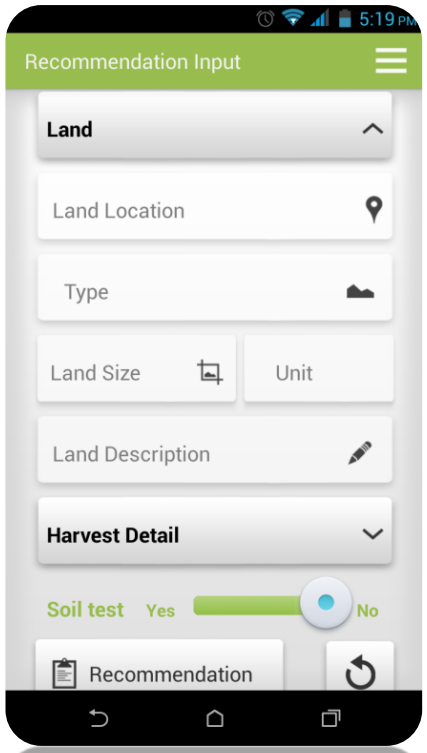
a soil analysis solution to identify optimum fertilizer application, improve input costs and increase yield

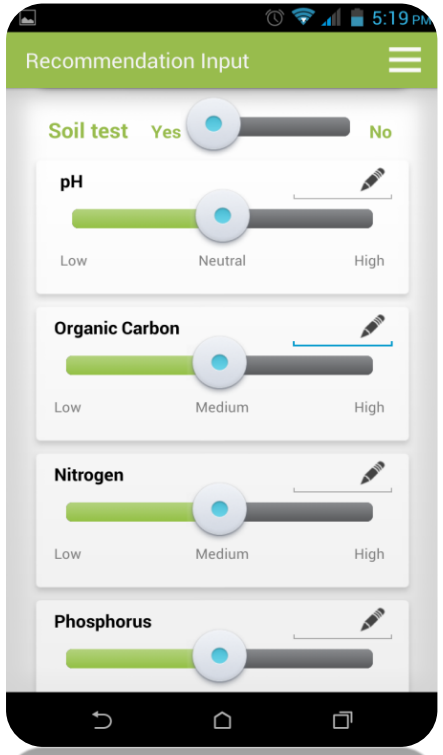
Land Details
- Characteristics of plot
- Size of plot

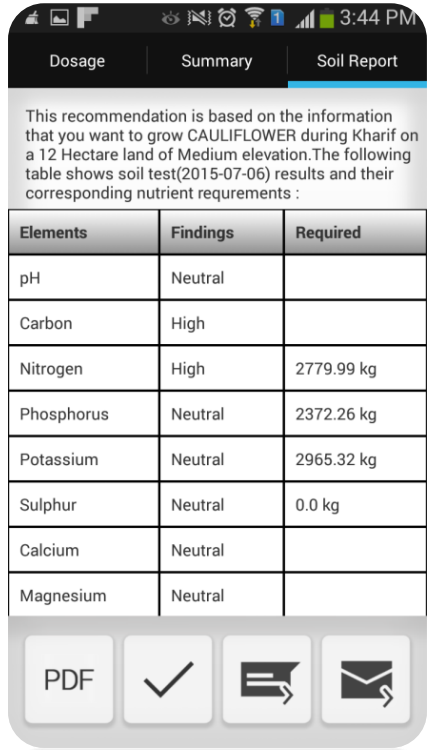
Harvest Details
- Type of Crop
- Irrigation source

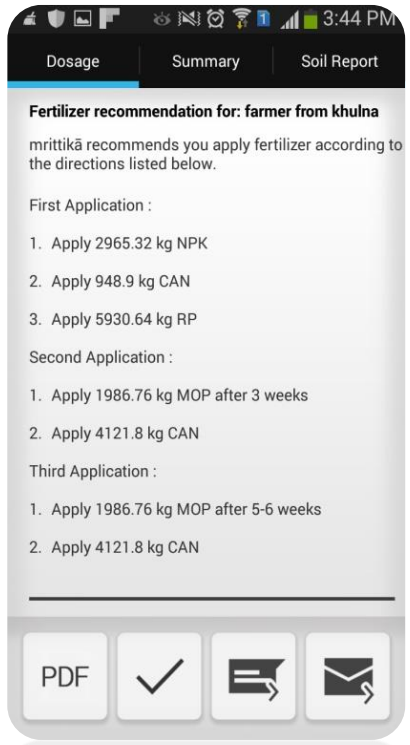
Soil and Seasonality
- Crop season and cycle
- Soil test to identify characteristics of soil (PH, N, P, K, OC)

Recommendation
- Best combination of right fertilizers; Optimal quantity and cost
- Guidance on how and when to apply







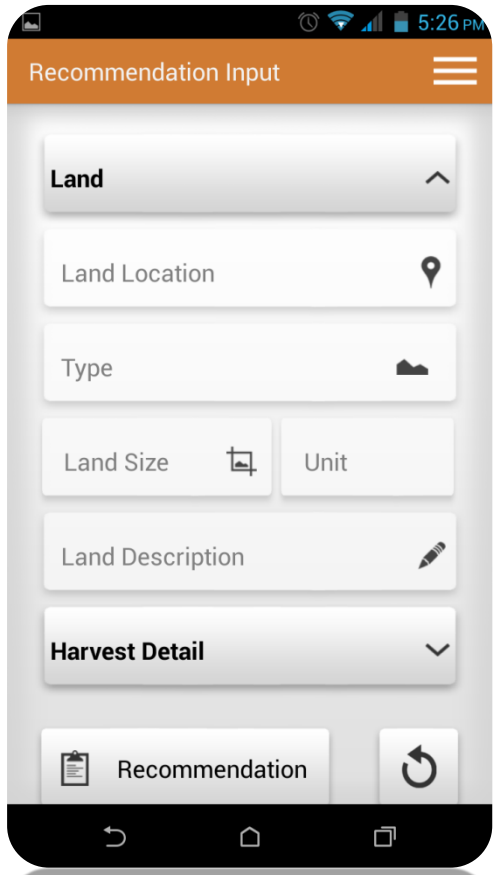


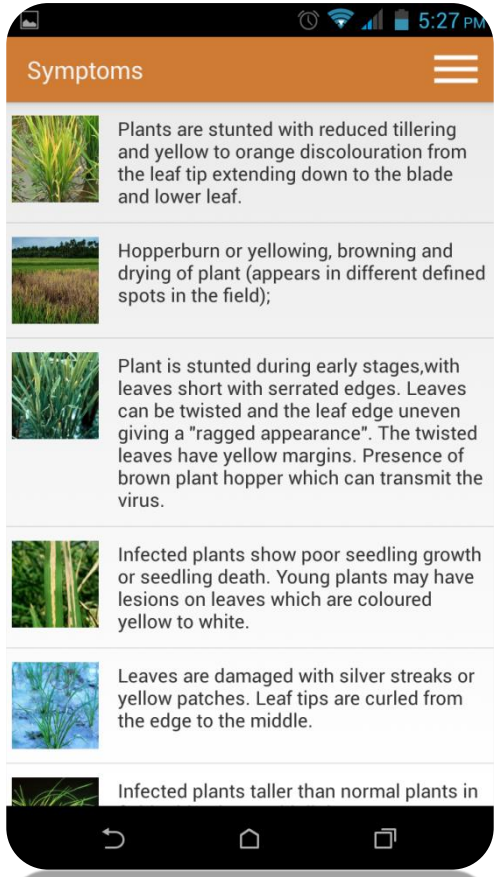
Source: Grameen-Intel Social Business

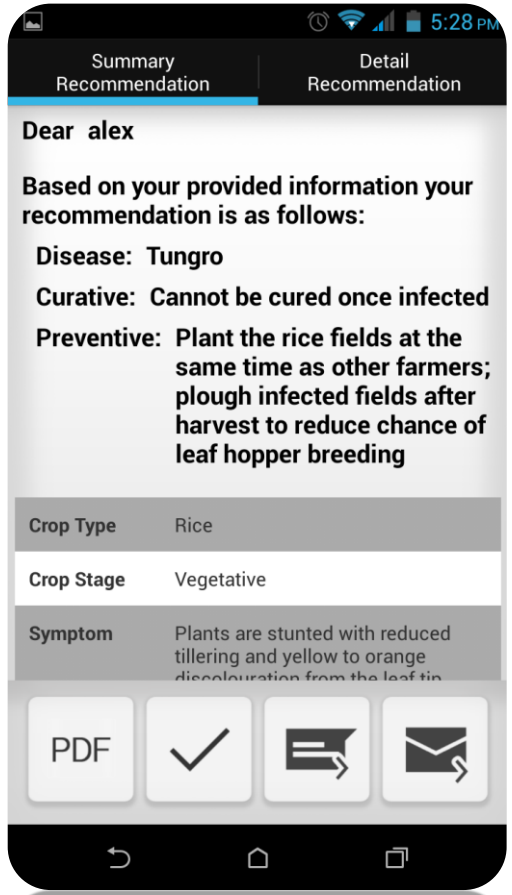
protikar
a solution to help farmers preventing, controlling and fighting plant diseases, weeds and pests based on best practices

Details on Pest
- Identify crop symptom by guided diagnosis
- Localized database describing most pests

Recommendation
- Best practices to prevent and fight pests and diseases
- Optimal application of curative measures (organic or chemical)







Source: Grameen-Intel Social Business

Integrated working model as part of a sustainable extension services and data access for further insights

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1. **Farmers** provide basic crop specific information

ENTREPRENEUR/ EXTENSION WORKER

2. **Micro-entrepreneur** does local soil test and inputs soil analysis

eAgro Portal

FARMER

4. **Local micro-entrepreneurs** provide:
- Recommendations on fertilizer, seed and pest control application
- Connect farmers to buyers/ markets

Data back up to support in case of data loss; regular monitoring

5. Farmer sources recommended inputs and follows best agri practices

3. GISB solution derives recommendation for best yield at lowest input cost

SUPPLIER

Farmer/ Customer

Agri Extension Service

ICT Solution/Tool

Source: Grameen-Intel Social Business

Partnership and collaboration with int. organizations and governments for sustainable agriculture development

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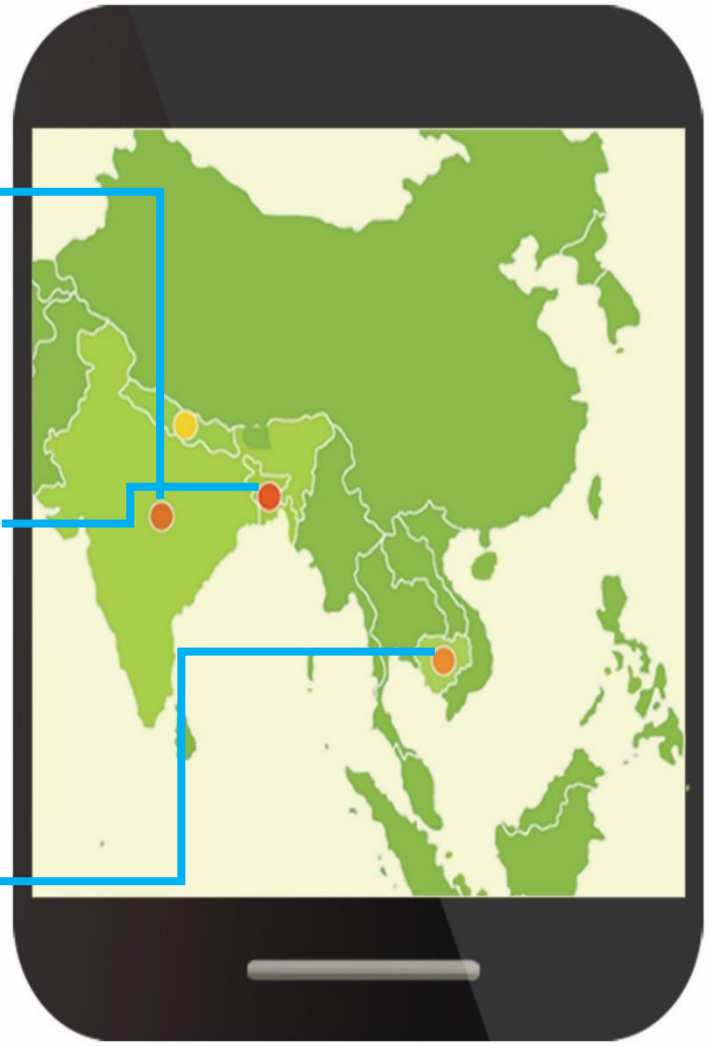
Partnership with eKutir in Odisha, **India**

Project Harvest in **Bangladesh**- local entrepreneur and institutional partners

krishē – Call-center based fertilizer recommendation service launched in **Bangladesh**

ePADEE in **Cambodia** funded and supported by IFAD, SNV, iDE



Offering:
- Capacity building
- Expert agriculture knowledge
- Leveraging access to ICT tools

Positive changes in:
- Livelihood development
- Food security
- Income generation
- Soil health maintenance

Sustainable development by:
- Reduced barrier in ICT education
- Entrepreneur creation
- Reducing environmental impact

GISB e-Agro impact assessment:
ePADEE CASE STUDY Cambodia

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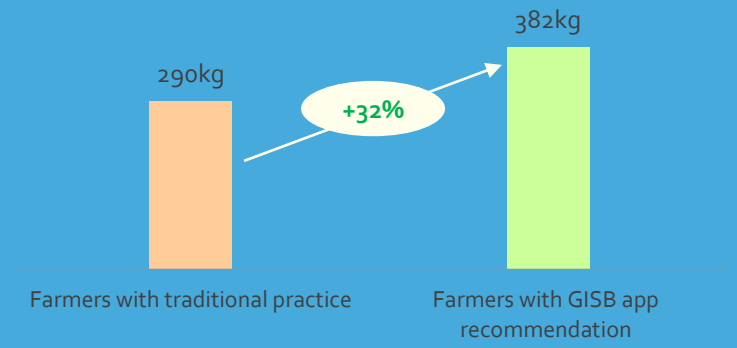
Impact highlights of GISB solutions

- 32% Higher Yield
- 47% increase in pot. gross margin
- 1650 farmers served
- ~170 trained extension agents
- >90% acceptance

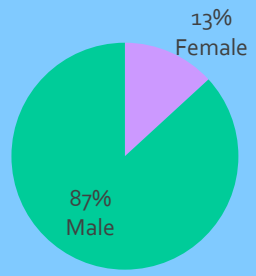
Comparative picture between the farmers who received recommendations vs those who did not:

USERS OF GISB APPS ACHIEVE HIGHER YIELD

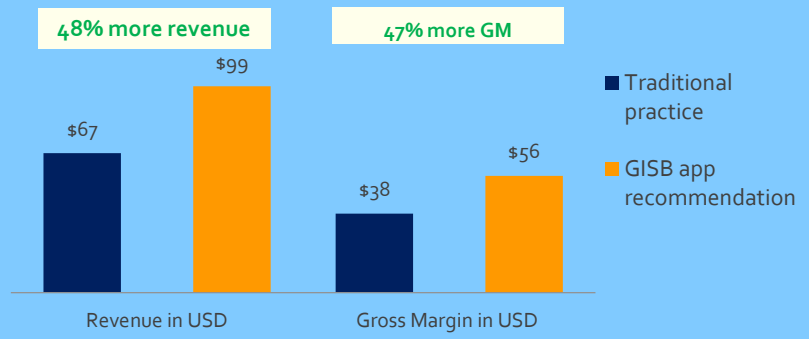


SKILL DEVELOPMENT

Trained extension workers - female and male



FARMERS USING GISB APPS WITH OPPORTUNITY FOR HIGHER REVENUE & GROSS MARGIN



BENEFICIARIES

Farmers applied ICT recommendation

Outlook: Integrated smart food programs to address priorities of Governments across the agriculture and food value chain

Govern-ment Challenges	**Fraud** at distribution of **subsidized inputs** **Low quality inputs** **Tax/VAT fraud**	High **rural unemployment** **Low yield** and **high risk** traditional farming practices No **mapping of farmers**	**Fraud at weighing** of farmer produce Compensation of farmers **below market value**	**Loss of produce** through theft or perishing **Low efficiency** due to lack of infrastructure, logistics, innovation	**Risk of market exclusion** - EU 'track & trace regulation; pesticide contamination **Tax fraud**

Digital transformation and smart solutions to tackle challenges in agriculture and food value chain

- **Job creation for rural youth & less urbanization**
- **Better livelihood for small holder farm families**
- **Ensure food security on a national level**
- **Insights on farmers, produce, climate impact...**

- **Limit fraud across the value chain**
- **E2E tracking and tracing across the value chain**
- **Ensure fair pricing**
- **Fiscal compliance**

Solution in Development: Digital Test Kit

Current State – Manual Test Kit

- Not easily portable
- Results can be difficult to interpret
- Time and labor intensive process

Future State – Digital Test Kit

- Portable
- Electronic reading of results
- Faster processing

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Thank you!

Come to our booth for questions and more information.