



# mKRISHI

## Mobile based Agro Advisory System

*By*

*Dr. Arun K Pande & the Team*

# AGENDA

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- **Motivation**
- **Requirements of Farmers**
- **Description**
  - **Architecture**
  - **Mobile Application**
  - **Expert Console**
- **Field Trial Experience**
- **Social Networking**
- **Impact of Innovation**
- **Summary**
- **Demonstration**



## Motivation - Farmer's Queries

### My Soil

Which crop I should grow ?

Which fertilizer I should apply ?  
In what quantity ? When ?

Can I grow grapes ?

I plan to dig a well. Will it hit  
water?



### My Crop

Which seeds I should buy ?

Should I spray pesticide ?  
Which one ? When ?

Leaves look Yellowish ? What  
should I do?

Can I get Rs 25000 loan in a  
week for sowing operation ?

### My Produce

What is the rate for cotton in  
nearby market ?

How can I get better rates ?

Is there a space in nearby  
warehouse for storage for a  
month?

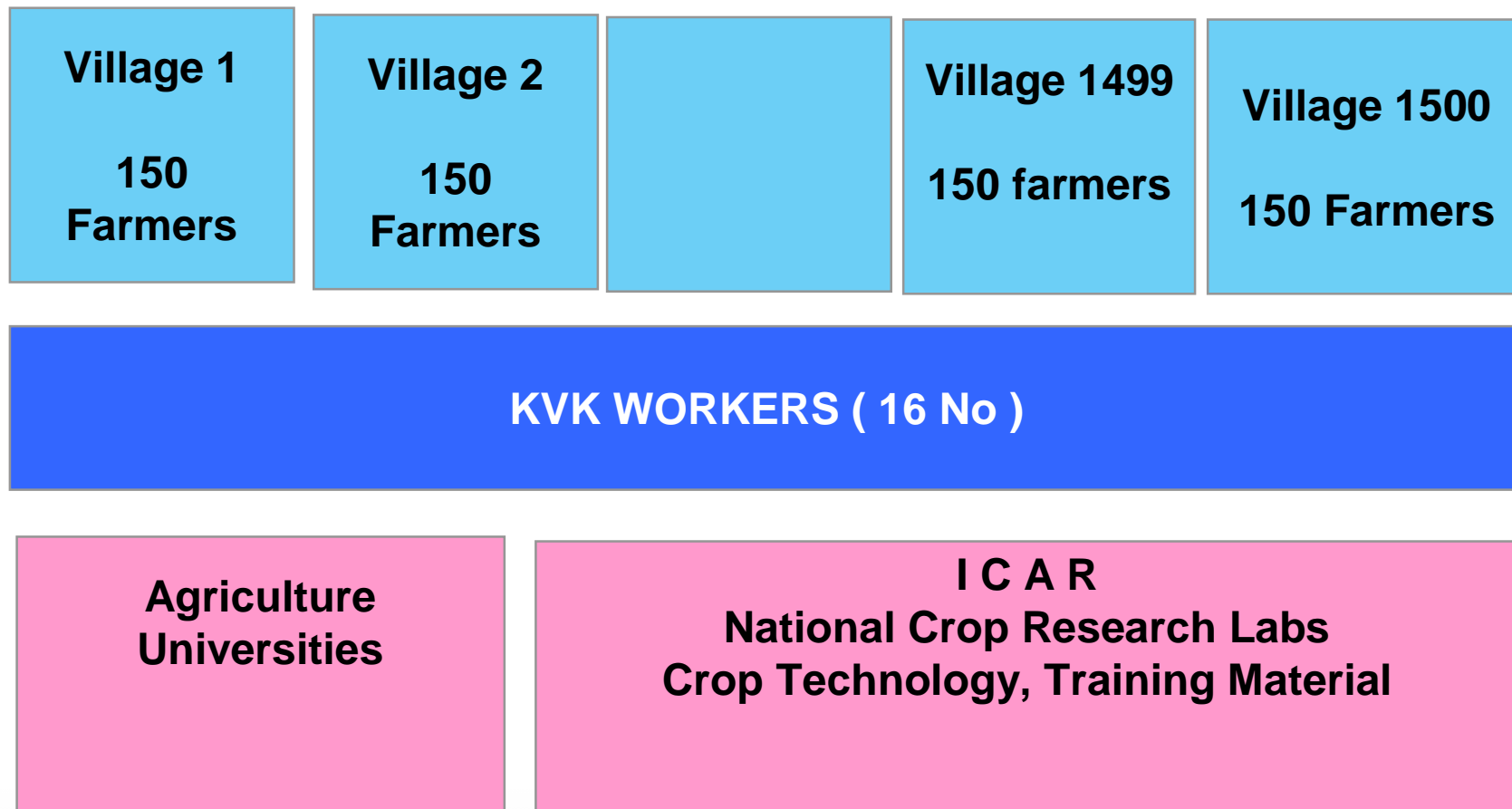
### My Family

Where can I find doctor  
nearby?

My son will complete high  
school this year? Should he  
do computer courses?

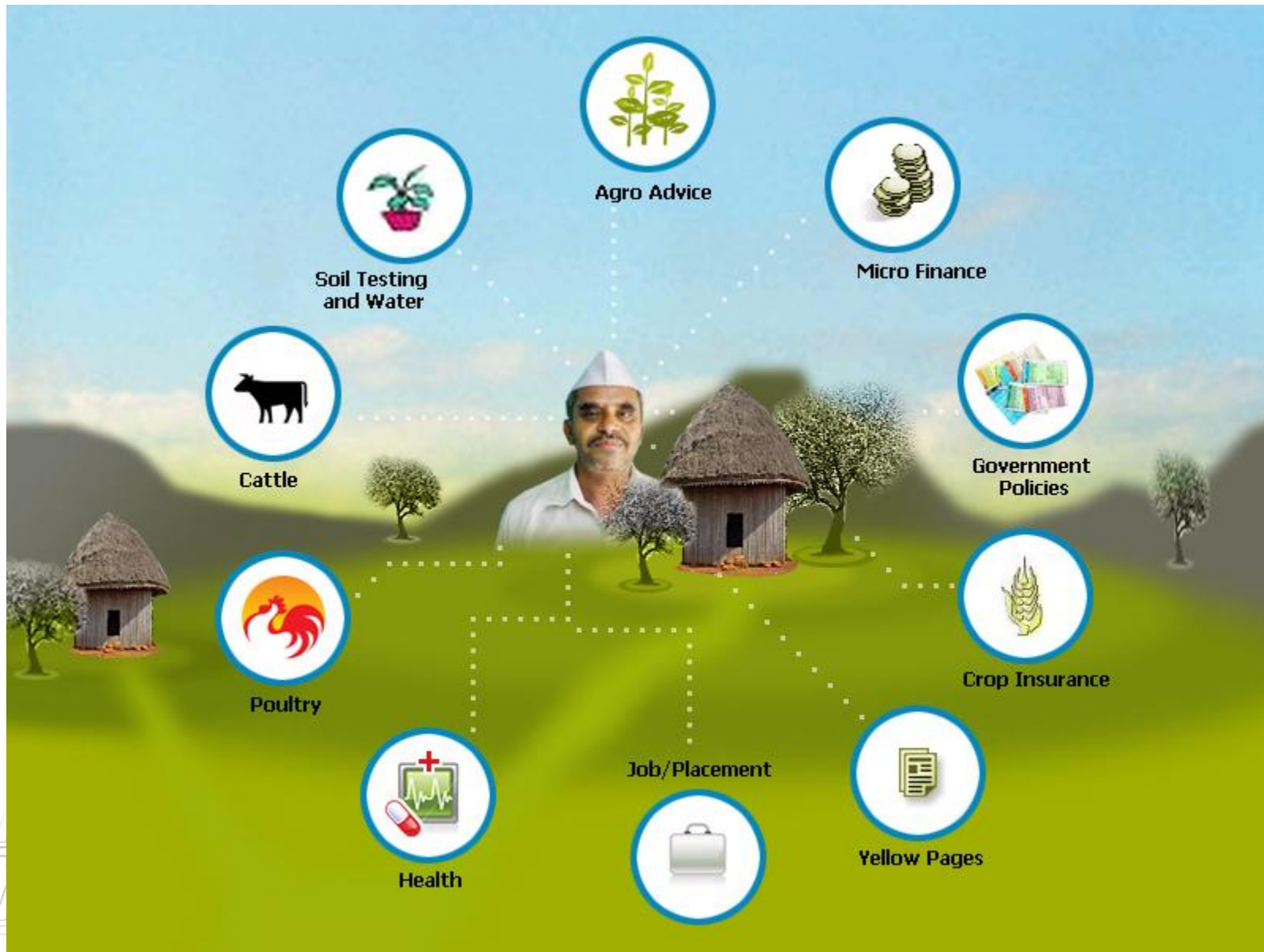
How I can earn additional  
income?

## Motivation – Problems faced in the existing EXTENSION work



**World's Best Crop Technology does not reach the farmers**

# MOTIVATION - FARMER'S REQUIREMENTS





# Motivation - The Gap



Central Government



State Government



Block Development Office



Universities



Research Labs

expert advice



information



Market



Certified Seeds

healthcare



Hospitals

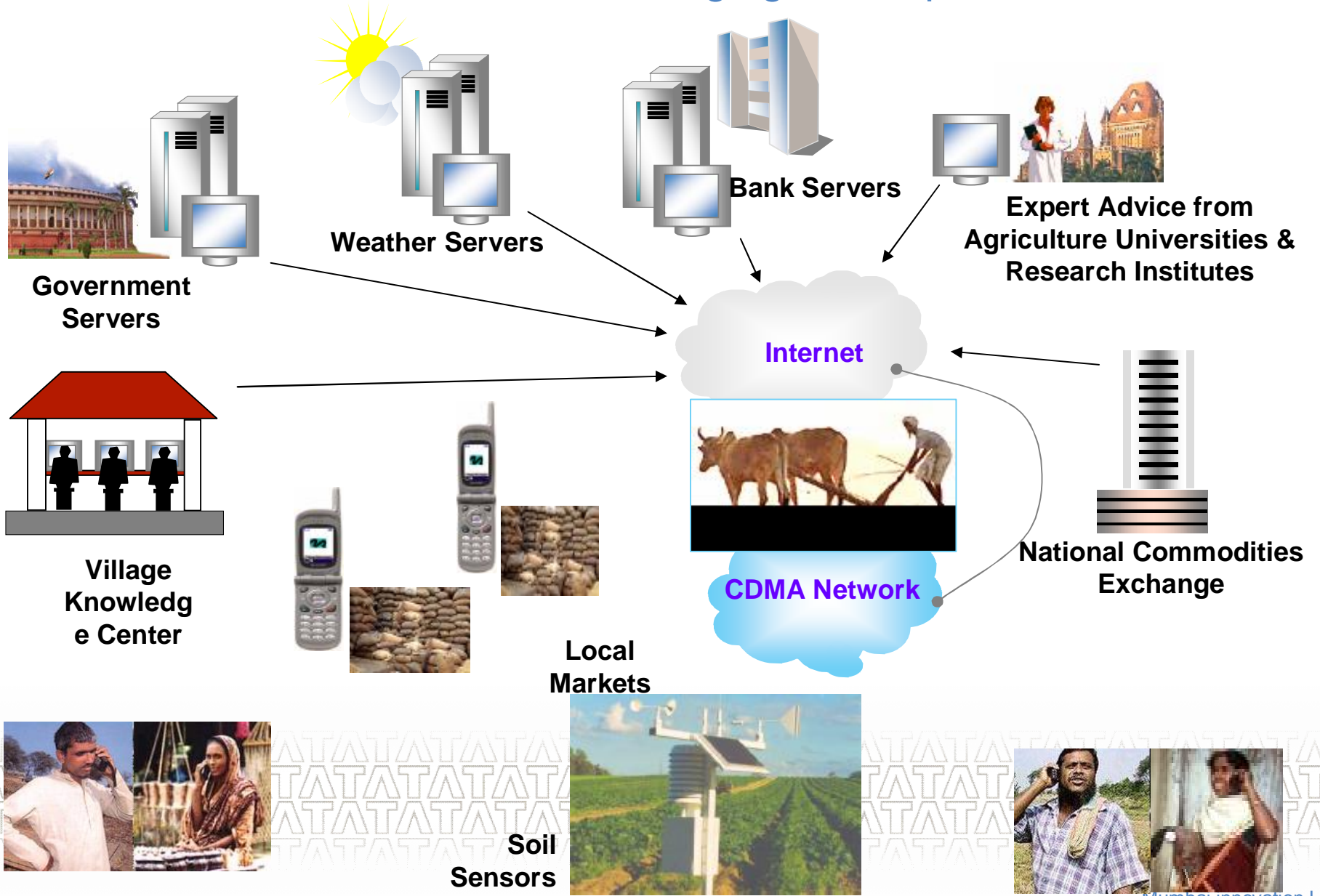
credit



Banks

info regarding schemes etc.

# Motivation - Bridging the Gap

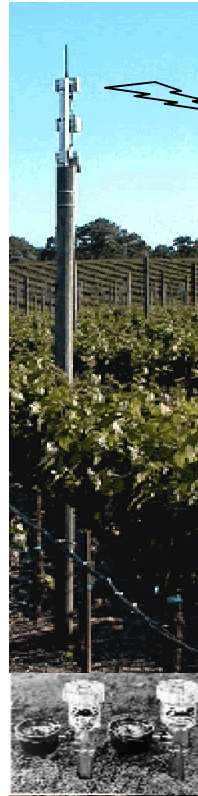




# DESCRIPTION - Architecture



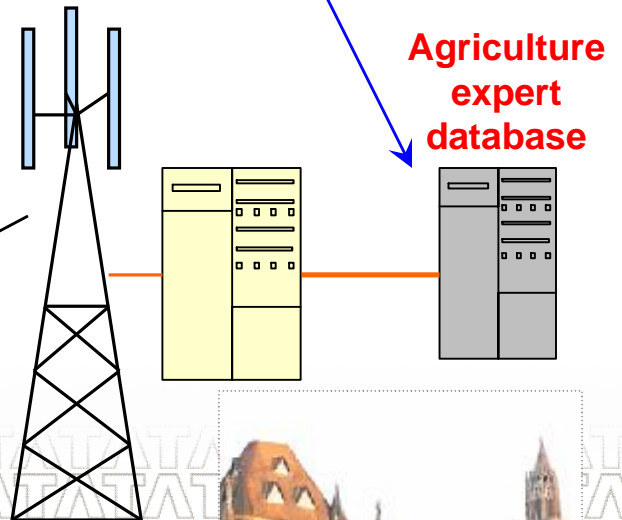
1. Sensors collect soil data



Data consolidation unit

2. Consolidate

- 3. Parse information and retrieve accurate advice
- 4. Prepare and send SMS in local Language.



Agriculture expert database



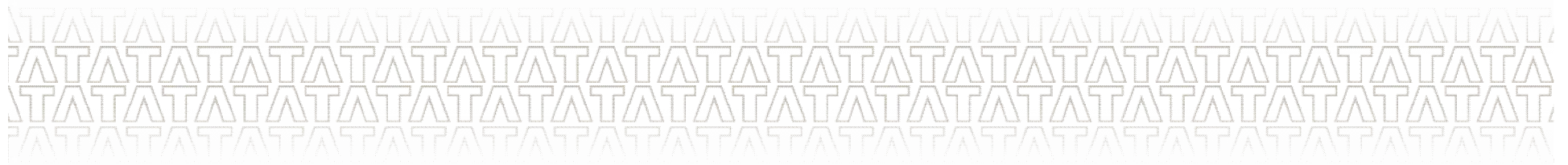
5. SMS to farmer in local language



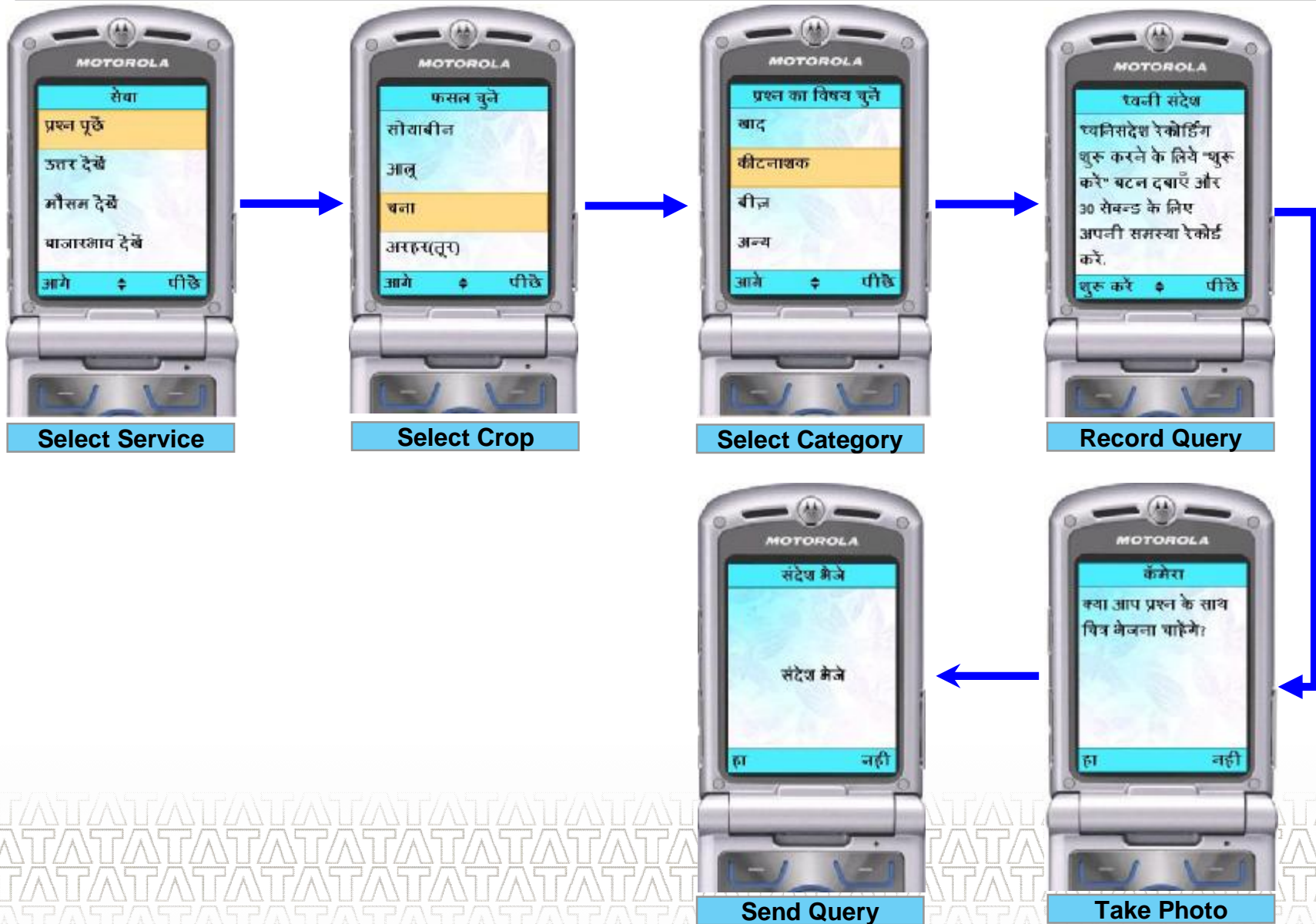
Mumbai Innovation Lab  
TCS SRTT confidential



# Mobile Application for Farmers



# MOBILE APPLICATION – Raise Query Service



# WEB Application for Agri Experts



# EXPERT CONSOLE - Log In

File Edit View Favorites Tools Help

Address <https://121.241.6.211:8443/AdminConsole/welcome.do> Go

**TATA CONSULTANCY SERVICES**

**mKRISHI™**

Tata Consultancy Services Limited provides Crop specific advice to the farmers with the help of Agriculture experts through mKRISHI services. This service is available only for the registered farmers for this project.

This Web-based application provides the functionality to the field agents to register the farmers with the mKRISHI system as well as the experts to analyze the farmer queries and provide their advice.

**User Name**  
9869442298  
[Enter the 10-digit phone number.]

**Password**  
●●●●●●●●

Login

[Forgot Password?](#)

Enter logon details





# EXPERT CONSOLE - Home


Expertise - Microsoft Internet Explorer provided by TATA CONSULTANCY SERVICES LTD

File Edit View Favorites Tools Help

Address [https://121.241.6.211:8443/mkrishi\\_expert/dispatchExpert.do?session=4694DD20B619C04DAE83AD2544407109](https://121.241.6.211:8443/mkrishi_expert/dispatchExpert.do?session=4694DD20B619C04DAE83AD2544407109)

**mKRISHI™**

Welcome: Vinay Tuesday, May 26, 2009 [Logout](#) [Help](#)

[Expert's Home](#) 

Service: Agriculture  
Location: Maharashtra  
Crop: Grape  
Expertise: Nutrient

Show Queries

© Tata Consultancy Services Limited, 2009. All rights reserved. | [Disclaimer](#) | [Contact Us](#) | Note: Site best viewed in Microsoft Internet Explorer 6.0+ in 1024x768 resolution.

Done Local intranet

Start | m... | h... | N... | m... | F... | h... | u... | m... | h... | m... | M... | E... | 1:24 PM

Expert Home.  
Select  
location, crop  
and the  
expertise area.

# EXPERT CONSOLE - Inbox

mKRISHI™

Welcome: Vinay

Sunday, May 24, 2009

[Logout](#)

Agriculture>Grape>Nutrient

[Help](#)

Queries can be rerouted to higher expertise

| SMS Queries | Voice Mail Queries | Forwarded Queries | Query Type | Date And Time    | Question No         | Location                       | Name        | Phone No   | Status | Forward | Delete |
|-------------|--------------------|-------------------|------------|------------------|---------------------|--------------------------------|-------------|------------|--------|---------|--------|
|             |                    |                   |            | 20.04.2009-15:07 | <a href="#">181</a> | Sangli,Maharastra              | TCS Testing | 9223735897 | Open   |         |        |
|             |                    |                   |            | 20.04.2009-16:38 | <a href="#">186</a> | Sangli,Maharastra              | TCS Testing | 9223537548 | Open   |         |        |
|             |                    |                   |            | 04.05.2009-19:04 | <a href="#">314</a> | Sangli,Maharastra              | Mahadev     | 9223597029 | Open   |         |        |
|             |                    |                   |            | 04.05.2009-19:17 | <a href="#">315</a> | Sangli,Maharastra              | Mahadev     | 9223597029 | Open   |         |        |
|             |                    |                   |            | 15.05.2009-13:01 | <a href="#">383</a> | Sangli,Maharastra              | TCS Testing | 9223537548 | Open   |         |        |
|             |                    |                   |            | 20.05.2009-19:15 | <a href="#">394</a> | Mumbai Upnagar Jila,Maharastra | ILAB_SAN    | 9223363247 | Open   |         |        |
|             |                    |                   |            | 22.05.2009-11:02 | <a href="#">395</a> | Sangli,Maharastra              | TCS Testing | 9223537548 | Open   |         |        |
|             |                    |                   |            | 22.05.2009-16:48 | <a href="#">397</a> | Sangli,Maharastra              | TCS Testing | 9223735035 | Open   |         |        |
|             |                    |                   |            | 22.05.2009-17:01 | <a href="#">402</a> | Sangli,Maharastra              | TCS Testing | 9223735035 | Open   |         |        |
|             |                    |                   |            | 22.05.2009-17:02 | <a href="#">403</a> | Sangli,Maharastra              | TCS Testing | 9223735035 | Open   |         |        |
|             |                    |                   |            | 22.05.2009-17:02 | <a href="#">404</a> | Sangli,Maharastra              | TCS Testing | 9223735035 | Open   |         |        |
|             |                    |                   |            | 22.05.2009-17:07 | <a href="#">411</a> | Sangli,Maharastra              | TCS Testing | 9223735035 | Open   |         |        |
|             |                    |                   |            | 22.05.2009-17:08 | <a href="#">412</a> | Sangli,Maharastra              | TCS Testing | 9223735035 | Open   |         |        |
|             |                    |                   |            | 22.05.2009-17:37 | <a href="#">426</a> | Sangli,Maharastra              | TCS Testing | 9223537548 | Open   |         |        |

Done

Internet

100%

# EXPERT CONSOLE

https://121.241.6.211:8443/mkrishi\_expert/expertConsole.do?queryID=314 - Microsoft Internet Explorer provided by TATA CONSULTAN

File Edit View Favorites Tools Help

Address https://121.241.6.211:8443/mkrishi\_expert/expertConsole.do?queryID=314

**mKRISHI™**

Welcome: Vinay

**Farmer's Information**

Cell No: 9223597029

Name: Mahadev Chauhan  
 Education: Under 10 th  
 Family Size: 5  
 Village: Borgaon  
 Landmark: Sangli  
 Taluka: Tasgaon  
 District: Sangli  
 State: Maharastra

**Soil Information**

Soil Information

Sampling Date: 2009-03-15 Analysis Date: 2009-03-15 Soil Type:

| Total Survey Area | CaCO <sub>3</sub> (ppm) | pH (ppm) | Soil Conductivity (ppm) | Org Carbon (ppm) | Org Matter (ppm) | N (ppm) | Ph (ppm) | K (ppm) | S (ppm) | Ca (ppm) | Mn (ppm) | Fe (ppm) | Mo (ppm) | B (ppm) | Zn (ppm) | Mg (ppm) | Na (ppm) | Cu (ppm) | Mangal (ppm) |     |
|-------------------|-------------------------|----------|-------------------------|------------------|------------------|---------|----------|---------|---------|----------|----------|----------|----------|---------|----------|----------|----------|----------|--------------|-----|
| 25.0              | 154/1                   | 23.0     | 8.0                     | 2.5              | 45.0             | 203.0   | 43.0     | 67.0    | 12.0    | 0.0      | 0.0      | 0.0      | 0.0      | 0.0     | 0.0      | 0.0      | 0.0      | 0.0      | 0.0          | 0.0 |

**Land Information**

| Crop | Rainfed | Irrigated | Source | Crop Rotation | Variety | Sowing Time | Crop Part |
|------|---------|-----------|--------|---------------|---------|-------------|-----------|
|      |         |           |        |               |         |             | 1 2 3     |

**Nutrient History for Grape**

| Name    | Season  | Application Date | Quantity |
|---------|---------|------------------|----------|
| Compost | January | 19-01-2009       | 555      |
| S.O.P.  | January | 26-01-2009       | 123      |

**Weather Forecast**

Sensor Data

Weather Forecast

**Contentment (Your Advice)**

(Note: Upload only .png image upto 100KB)

Browse... Expert Information Save Submit

Soft Keyboard  
Multilanguage Editor

Done Local intranet 1:05 PM

Info specific to crop

From public website

Sensor data – if applicable

Voice query

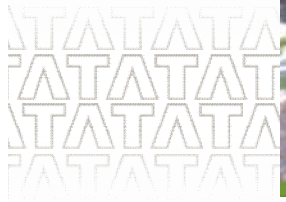
Picture

Ready references for expert



## EXPERT CONSOLE – Crop Image

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# mKRISHI – Field Trials (Borgaon, Waifad, Ganori, Bichaula )



# EXPERT CONSOLE – Sensors data

The screenshot shows a web browser window titled "mKrishi Sensors Reading - Microsoft Internet Explorer provided by TATA CONSULTANCY SERVICES LTD". The address bar shows a URL: [http://203.201.214.131:8089/Datalogger\\_Expert\\_Connector/graphDisplay.do?latitude=19.22402778&longitude=72.96652778](http://203.201.214.131:8089/Datalogger_Expert_Connector/graphDisplay.do?latitude=19.22402778&longitude=72.96652778). The page content includes a "Sensor Data" sidebar with checkboxes for Rainfall, Humidity, Canopy Temperature, Leaf Wetness, Dew point, Evatranspiration, Soil Moisture, Solar Radiation, and Air Temperature. A "Submit" button is located at the bottom of the sidebar. The main area displays four line graphs under the heading "Graphical presentation of Sensor data":

- Rainfall (mm vs Day):** A line graph showing a single sharp peak on May 22, reaching approximately 40 mm. A blue callout bubble labeled "Rainfall" points to this peak.
- Humidity (% vs Day):** A line graph showing fluctuating humidity levels between approximately 40% and 90% from May 22 to 26. A blue callout bubble labeled "Humidity" points to the graph.
- Canopy Temperature (°C vs Day):** A line graph showing temperature fluctuations between approximately 20°C and 45°C. A blue callout bubble labeled "Canopy" points to the graph.
- Leaf Wetness (% vs Day):** A line graph showing a single sharp peak on May 22, reaching approximately 70%. A blue callout bubble labeled "Leaf" points to this peak.

The browser's taskbar at the bottom shows the Start button, several open application windows, and the system tray with the time 1:08 PM and "Local intranet" indicator.

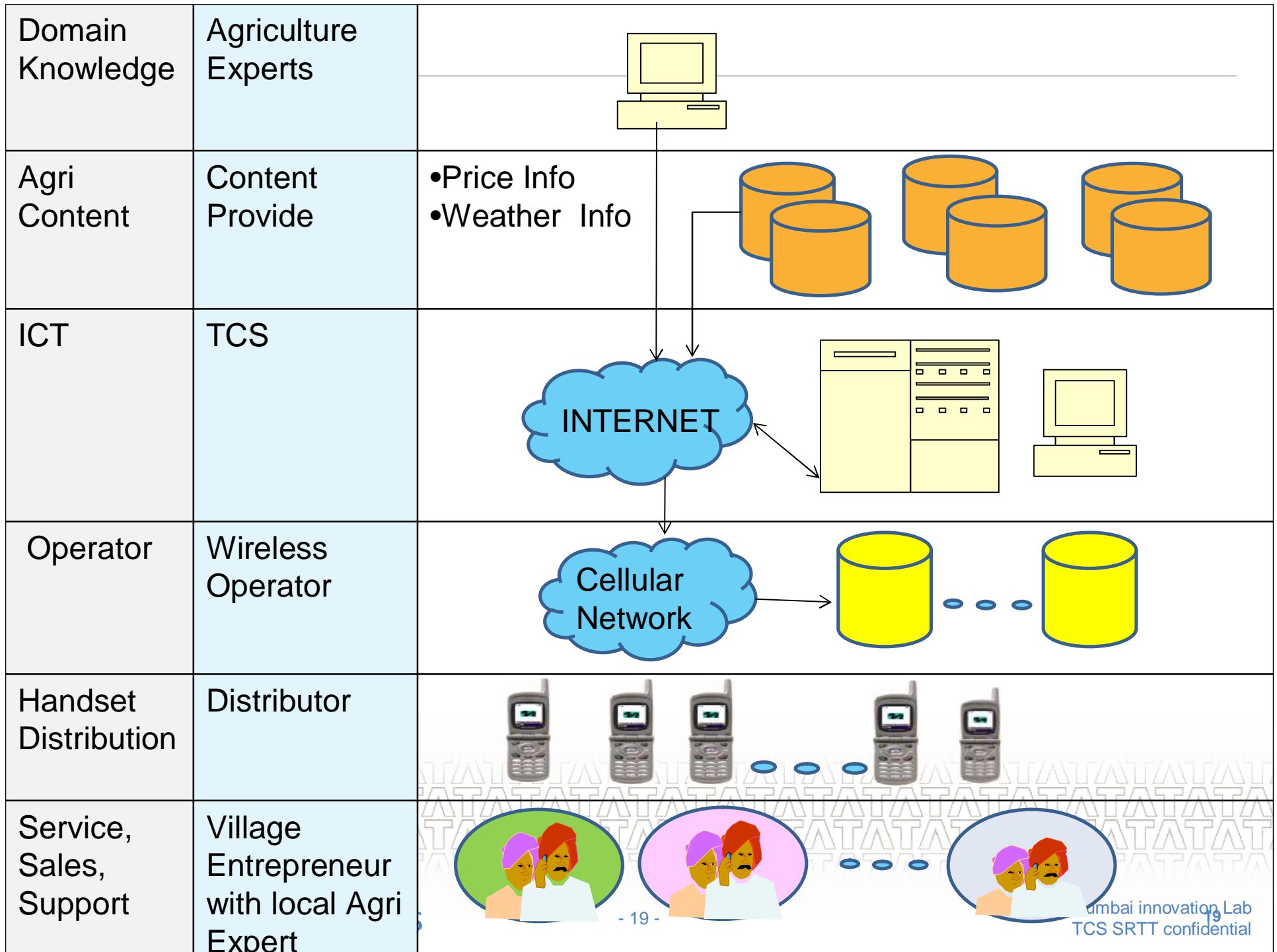
## mKRISHI Field Trial - Experience

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- Farmer and Expert interaction works very well.
- Farmer got a feeling that they have somebody to turn to for advice.
- Farmer learnt to use the application in four hrs.
- Sensors transmitted data faithfully and periodically.
- Local person could take care of weather station and sensor maintenance.
- Need for local person was felt at all levels.
- Farmer's needs to be addressed in integrated fashion.











- GappaGoshti is a social networking solution for the rural masses.
- It uses voice microblogs and native language to digitally connect the rural masses.
- Using GappaGoshti a user can:
  - interact with his friends
  - interact with an expert to get advice on his queries
  - participate in discussions
  - voice his opinion
  - start a new forum
  - view customized data feeds
  - view the latest news feeds
- GappaGoshti is customized for each region by customizing
  - the prompts : native language
  - the expert : familiar with local language and conditions



## Impact of Innovation

| Component of Innovation   | Economic   | Social  | Environmental   |
|---|--|---|---|
| Personalized advice on right type and right amount and right timing of fertilizer, pesticide and seeds. | <ul style="list-style-type: none"> <li>• Higher yield</li> <li>• Better Quality</li> <li>• Reduced Cost</li> <li>• Better price</li> <li>• Improved Productivity</li> <li>• All eco-partners make money.</li> </ul> <p style="color: purple;">Sector will attract private funds.</p> | <p>Increase in farmer's awareness.</p> <p>Gap between farmers and stake holders is bridged.</p> | <p>Reduction in soil erosion</p> <p>Prevention of ground water pollution.</p> |
| Mandi Price   | Get better rate for the produce  | Bargaining power improves   |   |
| Skill building packages on mobile phone   |  | <p>Farmer's skill improves</p> <p>Awareness of best practices.</p>                              |   |
| Entrepreneurs, Local Agro advisors, Remote Experts from Univ and Research labs                          | Rural BPO  | Employment generation   | Agro technology reaches farmers.  |

# Summary

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- mKRISHI addresses **personalized** queries.
- mKRISHI allows **both ways** interaction between farmer and experts.
- Expert has access to **Static & Dynamic** information in the farm. Hence advice would be effective.
- **Individual farmer** can be targeted.
- Pesticide and fertilizer application history **allows audit** of pesticide usage in a particular farm.
- Has potential to create significant **economic, social** and **environmental** impact.

- Generate **employment** for Agriculture graduates and **create wealth** through entrepreneurs.



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# Grapes Queries




# Expert Console

http://203.201.214.131:8089/mkrishi/GetExpertConsole?id=1519 - Microsoft Internet Explorer provided by TATA CONSULTANCY SERVICE

File Edit View Favorites Tools Help

**mKRISHI** ATCS Initiative **Mobile based Agriculture Advisory System** TATA TATA CONSULTANCY SERVICES


**Farmer's Information**



Farmer ID:MH23346032  
Cell No:9226436427

Name: Pratap Vishvanath Shinde  
Place: Nimblak, Sangli  
Query Date: 22-12-2008 10:55  
Query Type: Nutrient  
PrunningDate: 2008-04-01  
Stage: Fruit bud growth/shoc growth start (61-120)

**Query**



[Images](#)

**Soil Status**

Sampling Date: 2008-05-14    Analysis Date: 2008-05-15    Soil Type: ---

| pH   | EC (µm) | Org C (%) | N (ppm) | P (ppm) | K (ppm) | S (ppm) | Ca (ppm) | Mn (ppm) | Fe (ppm) | Mo (ppm) | B (ppm) | Zn (ppm) | Mg (ppm) |
|------|---------|-----------|---------|---------|---------|---------|----------|----------|----------|----------|---------|----------|----------|
| 7.96 | 0.68    | 1.56      | 172.0   | 34.0    | 510.0   | 234.0   | 8250.0   | 0.0      | 2.2      | 15.0     | 0.0     | 2.82     | 1550.0   |

**Petiole Status**

Sampling Date: 2008-05-14    Analysis Date: 2008-05-15

| N (ppm) | P (ppm) | K (ppm) | S (ppm) | Ca (ppm) | Mn (ppm) | Fe (ppm) | Mo (ppm) | B (ppm) | Zn (ppm) | Mg (ppm) |
|---------|---------|---------|---------|----------|----------|----------|----------|---------|----------|----------|
| 1.71    | 0.27    | 1.63    | 0.08    | 1.89     | 374.0    | 61.0     | 10.0     | 25.0    | 70.0     | 4.78     |

**Fertilizer & Growth Hormone History**

| Time       | Fertilizer   | Qty/ Acre |
|------------|--------------|-----------|
| 11-05-2009 | सुपर फॉस्फेट | 100.0     |

[Know More](#)

**Weather Forecast**

[Sensor Data Graphs](#) <-- [Click here\(Last 4 Days\)](#)

Click on the weather button to view the weather

**Contentment (Your Advice)**

Soft Keyboard   [Multilanguage Editor](#)   Save

## Query Image 1

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## Advice Given By Expert

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पिक बेरी कशामूळे होऊ शकते १)संजिवकांचे अवाजवी वापर २)स्पर्दची कमतरता किंवा पालाशचे जास्त प्रमाण ३)फूलकिडीमूळे ४)जिबरेलिकअसिडचा आधिक वापर .  
उपाय- कॅल्शियम नायट्रेटचा ५ग्रॅम प्रति लिटर वापर करणे.



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# Potato Queries



# Expert Console

http://203.201.214.131:8089/mkrishi/GetExpertConsole?id=1683 - Microsoft Internet Explorer provided by TATA CONSULTANCY SERVICE

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Print Mail New Tab

## Mobile based Agriculture Advisory System

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**Farmer's Information**

Farmer ID:UP571223012  
Cell No:9259542915

Name: Ravindra Pal Singh  
Place: Sadalpur, Aligarh  
Query Date: 08-01-2009 04:18  
Query Type: Nutrient  
SowingDate: 2008-10-22  
Stage: Initial Stage  
Variety: Kufri Bahar  
SeedSource: Chambal Fertiliser

**Soil Status**

Sampling Date: 2008-10-15      Analysis Date: 2008-10-16      Soil Type: --

| pH   | EC (µm) | Org C (%) | P (Kg/ha) | K (Kg/ha) | S (ppm) | Cu (ppm) | Mn (ppm) | Fe (ppm) | B (ppm) | Zn (ppm) |
|------|---------|-----------|-----------|-----------|---------|----------|----------|----------|---------|----------|
| 8.79 | 0.331   | 0.196     | 2.24      | 263.76    | 13.67   | 13.67    | 12.12    | 1.56     | 0.192   | 0.673    |

**Petiole Status**

Sampling Date: null      Analysis Date: null

| N (ppm) | P (ppm) | K (ppm) | S (ppm) | Ca (ppm) | Mn (ppm) | Fe (ppm) | Mo (ppm) | B (ppm) | Zn (ppm) | Mg (ppm) |
|---------|---------|---------|---------|----------|----------|----------|----------|---------|----------|----------|
| 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0      | 0.0      | 0.0      | 0.0     | 0.0      | 0.0      |

**Fertilizer & Growth Hormone History**

| Time       | Fertilizer | Qty/ Acre |
|------------|------------|-----------|
| 10-12-2008 | Bhusudha   | 60.0      |

[Know More](#)

**Weather Forecast**

[Sensor Data Graphs](#) <-- [Click here\(Last 4 Days\)](#)

Click on the weather button to view the weather

Weather Forecast

**Query**

[Images](#)

**Contentment (Your Advice)**

Soft Keyboard   [Multilanguage Editor](#)   Save

Done
Local intranet



## Query Image

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## Expert Console

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आलू में दरार मिट्टी में बोरोन की कमी के कारन हो सकती है. इसके लिए बोवाई के समय ग्रानुबोर २ किलो प्रति एकड़ की दर से डालना चाहिए।



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# THANKS

