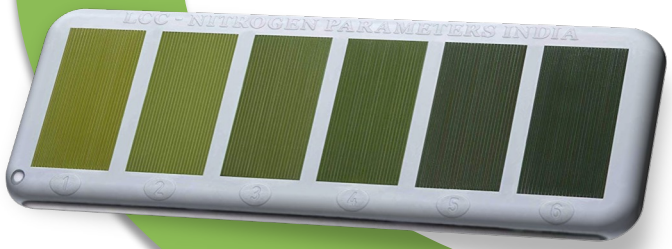


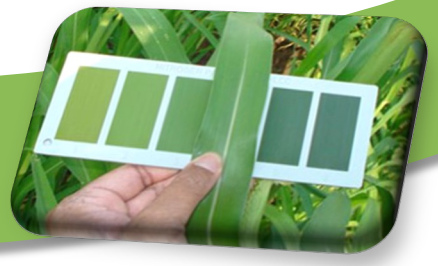
LEAF COLOR CHART

RAAICON

SMART LCC DEVICE

PADDY

WHEAT



MAIZE

PAPER TITLE

Smart LCC Device: LCC-Based IoT Device for measuring urea consumption in major food crops

AUTHORS

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IEEE Advancing Technology for Humanity

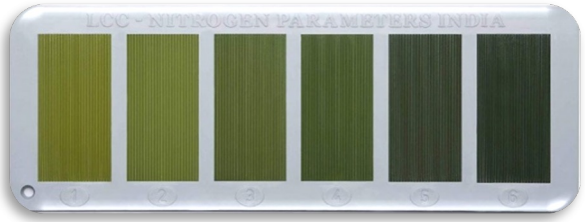
IEEE Robotics & Automation Society

IEEE Bangladesh Section

PRESENTATION SUMMARY

- Leaf Color Chart (LCC)
- Relationship between Leaf Color Chart (LCC) and the proposed IoT Device
- Tools and Technology used to develop the Device
- Device functionality and Features
- Relationship between the IoT Device and the online website
- Tools and Technology used to develop the website
- Project Snaps
- Advantages
- Future Plan

LEAF COLOR CHART (LCC) AND THE PROPOSED DEVICE



LEAF COLOR CHART

Leaf Color Chart

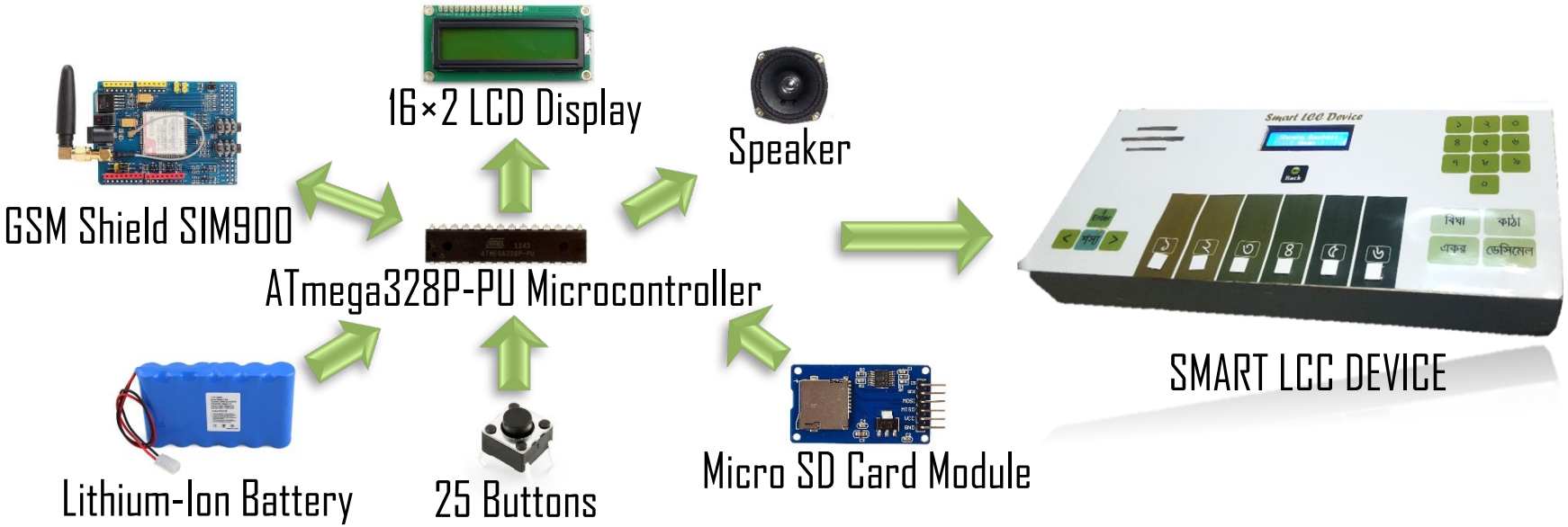
- The Leaf Color Chart (LCC) is a plastic, ruler-shaped strip containing four or more panels
- Ranging in color from yellowish-green to dark green
- Developed by International Rice Research Institute (IRRI)
- Cost-effective, visual and subjective indicator of plant nitrogen deficiency
- Also suitable for Maize and Wheat alongside with Paddy

SMART LCC DEVICE

Smart LCC Device

- Smart LCC Device is a digital version of manual LCC developed for the Bengali Farmers
- Digital audiovisual Device with IoT features
- To help Farmers to ensure either specific amount of lands requires Urea or not
- Display and tell the amount of Urea for Aman and Boro Paddy, Wheat and Maize if the land requires
- Can also send all the data with the exact location and time on an online website (lccdevice.cf)

TOOLS AND TECHNOLOGY USED TO DEVELOP THE DEVICE



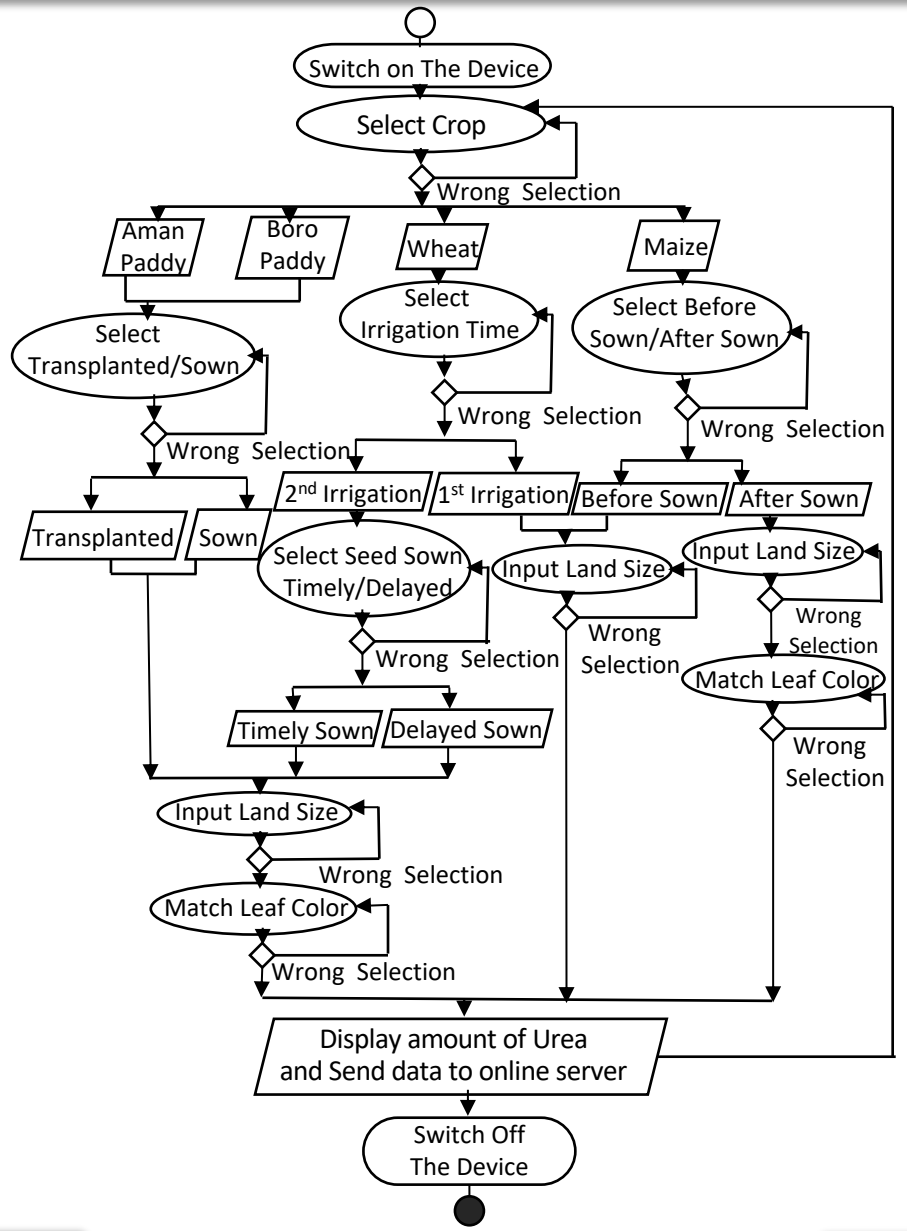
Hardware Tools

- Arduino UNO
- 16×2 LCD Display
- Micro SD Card Module
- GSM Shield SIM900
- Push-Buttons
- Speaker
- Rechargeable Lithium-Ion Battery
- 10 K Ohm fixed resistors
- 10 K Ohm Potentiometers
- Voltage Regulator (Buck Converter and Boost Converter)

Software Tools

- Arduino Integrated Development Environment (IDE)
- Liquid Crystal Library (for LCD Display)
- TMRPCM library (for audio sound)
- Software Serial Library (for serial communication with GSM Shield SIM900)
- SD and SPI library (for functioning Micro SD Card)

DEVICE FUNCTIONALITY



SMART LCC DEVICE

ADVANTAGES OF THE DEVICE

- Maximize yields of Crops
- Avoid diseases and better Crops
- Fertilizer at the right quantity at the right time when Crops needs
- Save money for farmers
- Huge subsidy savings on N fertilizer for Govt.
- Reduce Greenhouse Gas Emission

TOOLS AND TECHNOLOGY USED TO DEVELOP THE WEBSITE

Full Stack Development

Front-End

- HTML
- CSS
- Javascript
- Jquery
- Flexbox Grid
- Bootstrap Material Design

Back-End

- PHP
- MySQL

- MySQL Database Management System

SMART LCC DEVICE DATA TABLE IN THE WEBSITE

LCC Device Data Table

Show 5 entries Copy CSV Excel PDF Print Search:

ID	Location	Date & Time	Crop	Type	Irrigation	Land Size	Total Leaf	Average Color	Urea
698	Jogini Pasha, Khulna, Bangladesh	Wednesday| 20th March, 2019| 04:00 AM	Aman Paddy	Transplanted	Not Applicable	7 Katha	10	2.6	2 KG 620 GM
697	Baukati, Barisal, Bangladesh	Wednesday| 20th March, 2019| 04:34 AM	Maize	After Sown	Not Applicable	2 Bigha 3 Katha	15	2.87	17 KG 730 GM
696	Jogini Pasha, Khulna, Bangladesh	Wednesday| 20th March, 2019| 04:00 AM	Wheat	Late Sown	Second Irrigation	8 Decimal	10	3	2 KG
695	Dhankhola, Khulna, Bangladesh	Wednesday| 20th March, 2019| 04:55 AM	Boro Paddy	Transplanted	Not Applicable	34 Decimal	10	3.1	9 KG 180 GM
694	Jogini Pasha, Khulna, Bangladesh	Wednesday| 20th March, 2019| 04:00 AM	Aman Paddy	Transplanted	Not Applicable	1 Acre 7 Decimal	10	2.6	24 KG 340 GM
ID	Location	Date & Time	Crop	Type	Irrigation	Land Size	Total Leaf	Average Color	Urea

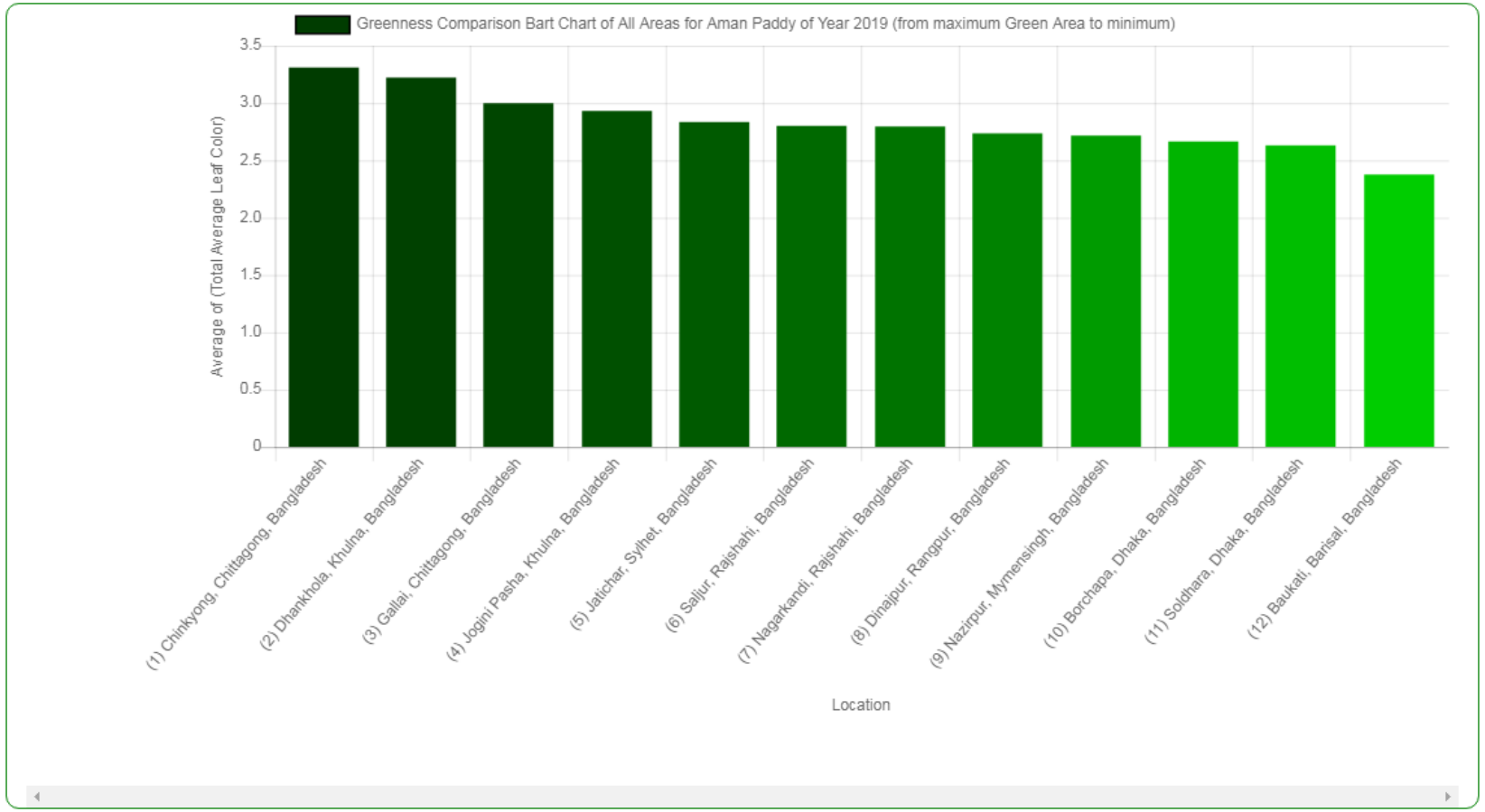
Showing 31 to 35 of 728 entries

Previous 1 ... 6 7 8 ... 146 Next

DATA ANALYSIS IN THE WEBSITE USING BAR CHART

Select an option below to display Comparison Bar Chart of All Areas

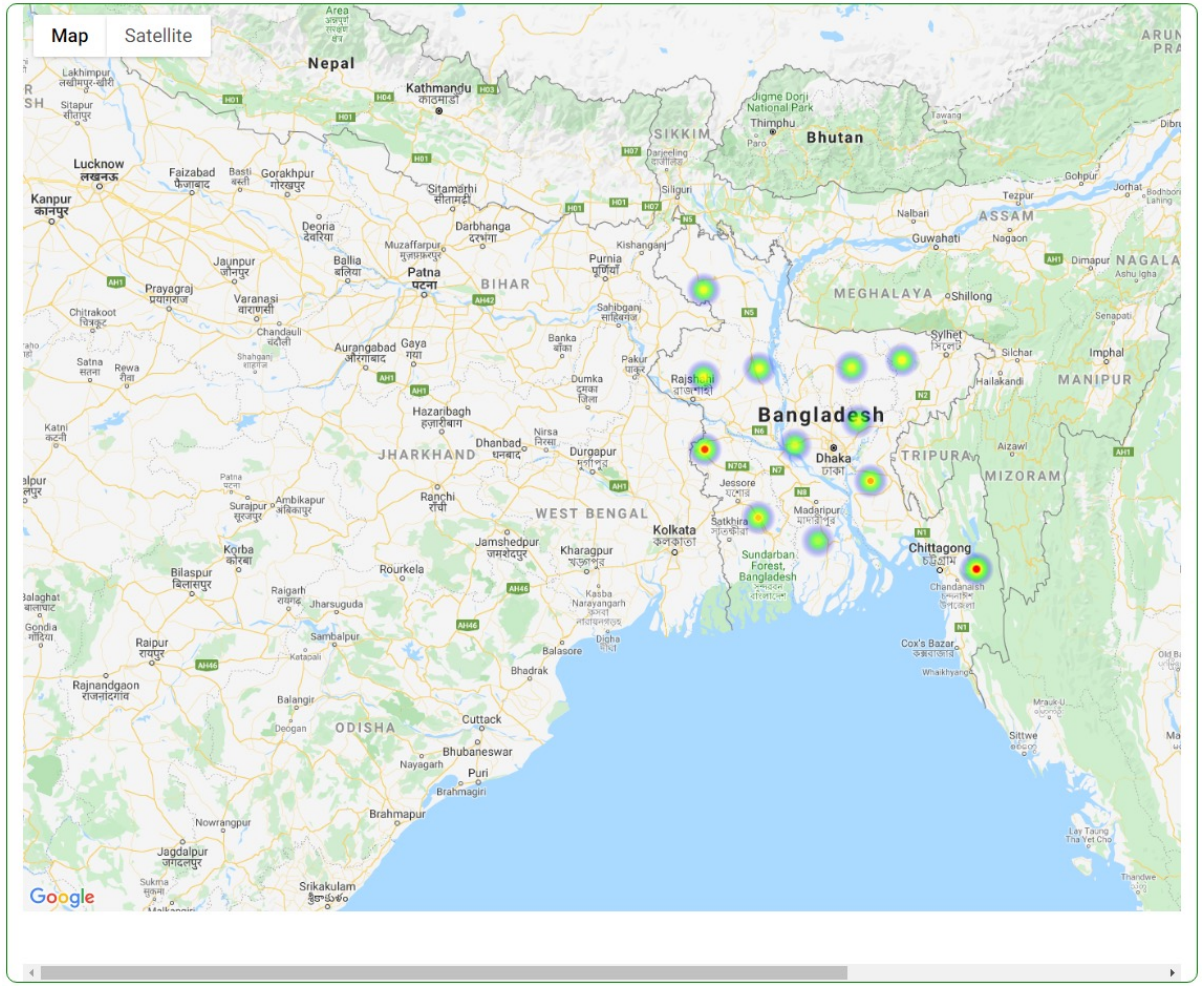
Analysis Selection: Greenness Analysis | Crop Selection: Aman Paddy | Year Selection: 2019



DATA ANALYSIS IN THE WEBSITE USING GOOGLE HEAT MAP

Select an option below to display Google Heat Map Comparison of All Areas

Analysis Selection: Greenness Analysis | Crop Selection: Aman Paddy | Year Selection: 2019



ADVANTAGES OF THE WEBSITE

- Generate countrywide urea provision statistics
- Give a viewpoint about which area is facing N deficiency in The Soil
- The Website will be proof of the Device effectiveness

FUTURE PLAN

- The Device can be developed for Sugarcane, Potato, Cotton, Cassava, Vegetables, Mustard, Oil palm, etc. after the Research and Development of Leaf Color Chart value is done

- Implementation of Bangla font in the Device Display

THE END

QUESTIONS AND ANSWERS