

“GIS based KRISHI UDHYAN”

**Pushpendra Kumar¹, Aditya Bhardwaj², Raj Kumar Das³
Yaggesh Sharma⁴ and Dr. Bhagwant Singh⁵**

^{1, 2, 3&4}Under graduate Student (2015-2019 Batch), University of Petroleum and Energy Studies, Dehradun Uttarakhand.

⁵Assistant Professor, School of Computer Science, University of Petroleum and Energy Studies, Dehradun Uttarakhand.

²bhardwajaditya0408@gmail.com , ³dasraj435@gmail.com , ⁴yaggeshsharma24@gmail.com ,

⁵bhagwant.jambh@gmail.com

Abstract:

This paper is developed on the concept of removing barricades for farmers in the agriculture market. An application will be used using which farmers can register to the online system. Every village will have 3 to 4 farmer leaders (Block-chain Nodes) who will have the application access as an admin for their village and will register the farmers of their particular village through the portal. Using GIS the location of these nodes will be used and the major functionalities will become functional like which crop should a node (Chain) sell today in the nearby market, which market should they proceed to with the particular crop, which crop should be harvested by the farmers of a node etc. This will form a block-chain which will in itself build a big network. The farmers will report to their head farmer about the crops they want to sell and will arrange for the crops to be sold in the market at the market price. The whole block will work as a small community and plan how to sell the crops in the market which they grow. The application will act as the backend manager for all of the block-chains and thus the whole system will be managed efficiently and the farmers will get a proper rate of the crop they have grown in these recent years. All the farmers will be provided will details of the current market rate list and all the updates in the rate will reflect instantly on the farmer application.

Key Words: ArcGIS Online, ArcGIS Pro, Arc Map, Web App Builder, Aadhar Database, Government Authorities.

About the Author:



Mr. Pushpendra Kumar

Mr. Pushpendra is currently pursuing B-Tech. in Computer Science Engineering with Specialization in oil and Gas Informatics, Batch 2015 – 2019 from University of Petroleum and Energy Studies, Dehradun.

He has a good knowledge of GIS and Documentation software e.g. ArcGIS Online, Arc Map, ArcGIS Pro and Latex.

Currently involved in a project on “GIS in School” for Schools of India based on Story Maps Concept and GIS Technology using ArcGIS Online initiated by **Esri India**. Areas of Interest include GIS Technology, python, JavaScript, Project management and Marketing.

Email ID: pushpendratomar56@outlook.com ,

Contact: +91 9690083918, 9315786706

Introduction

KRISHI UDHYAN is being designed keeping in notion the condition of the farmers of this country. Farmers these days, despite of working whole heartedly day-in and day-out, are not able to get what they actually deserve. They fall in the trap of the local dealers who buy crops from them at a very low rate and sell those at a great market price. This application tries to create an environment where selling of the crops can be done in a standardized manner which will be decided by the application. And it will aware the farmers about their field Information based on **GIS Technology**.

Agriculture is a field which needs huge development and this app provides a path for this development to take place. This app creates an environment where crop sale can be managed in a standard manner, based on previous year's data by government authorities like NABARD [1], Ministry of Agriculture Farmer welfare [2]. Various patterns will come out as a result of Analytics algorithm being applied on the data sets. These results will be used to generate feasible suggestion for the farmers and the farmers will have the idea of what should be grown if they have a doubt any time. The suggestions will be so much diverse that each farmer will have their own suggestion which will be designed for them only.

Location Analytics plays a vital role in the whole process. Demand-supply ratio will be maintained in the market with proper data. It will monitor that the crops don't get wasted and from the perspective of the market, data of the demand will make the supply sufficient and efficient. Thus a balance will be created in the whole system and this agricultural industry will be balanced to best possible confidence level. Thus this whole agricultural market would be influenced by the GIS technology enabled [3] application and this application will serve the nation.

For the further requirements, various maps will be used in the application which will be developed with the concept of GIS Technology and the help of **ArcGIS Online** [4], **ArcGIS Pro** [5] & **Arc Map** (courtesy of **ESRI India** [6]).

Further in the app, information regarding most important thing in agriculture i.e. total area of lands (in hectare) for cultivation and harvesting in India may be included. A map describes the districts wise areas with states of land for cultivation in India as shown in fig.1.

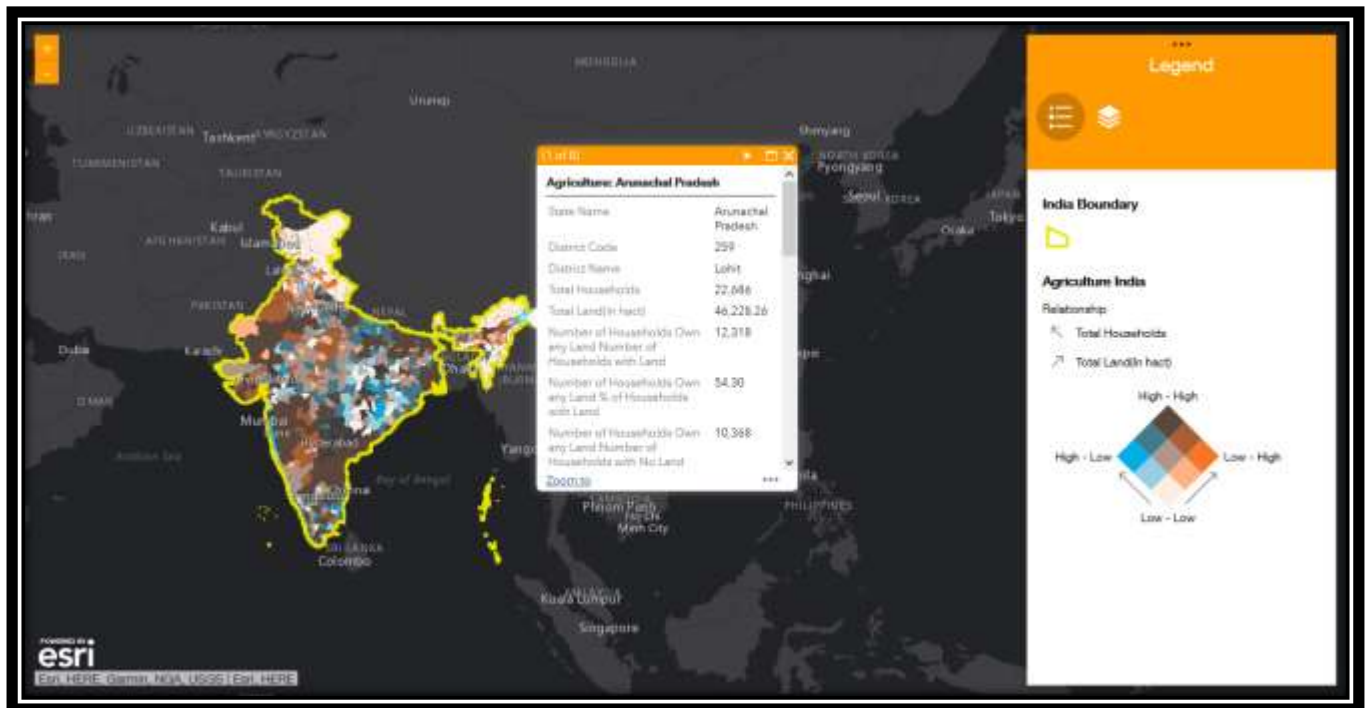


Fig: 1 – Agriculture in India

Main Aim and Objectives

- Locate all Crop Storage nearby the users and provide optimal path between their locations and selected storage.
- Provide great environment for the selling of crops to take place.
- Provide analytical results about market demand based on previous year crop selling record analysis [7].
- Provide suggestion to farmers about the crops they can grow when they have a doubt of which crop would be better based on GIS Information of that area.

Study Area

The Study area of this paper is Delhi NCR region of Uttar Pradesh. These specific areas of Uttar Pradesh are the districts of Baghpat, Hapur, Ghaziabad, Bulandsahar, Meerut and Gautambuddh Nagar [8].

After registration, Users can choose that area from the Map, according to their location, where they want to sell or buy crops in the particular area of their region from where they are registered. User will choose the area on the map based on the density of Crop Storage as shown in fig.2.

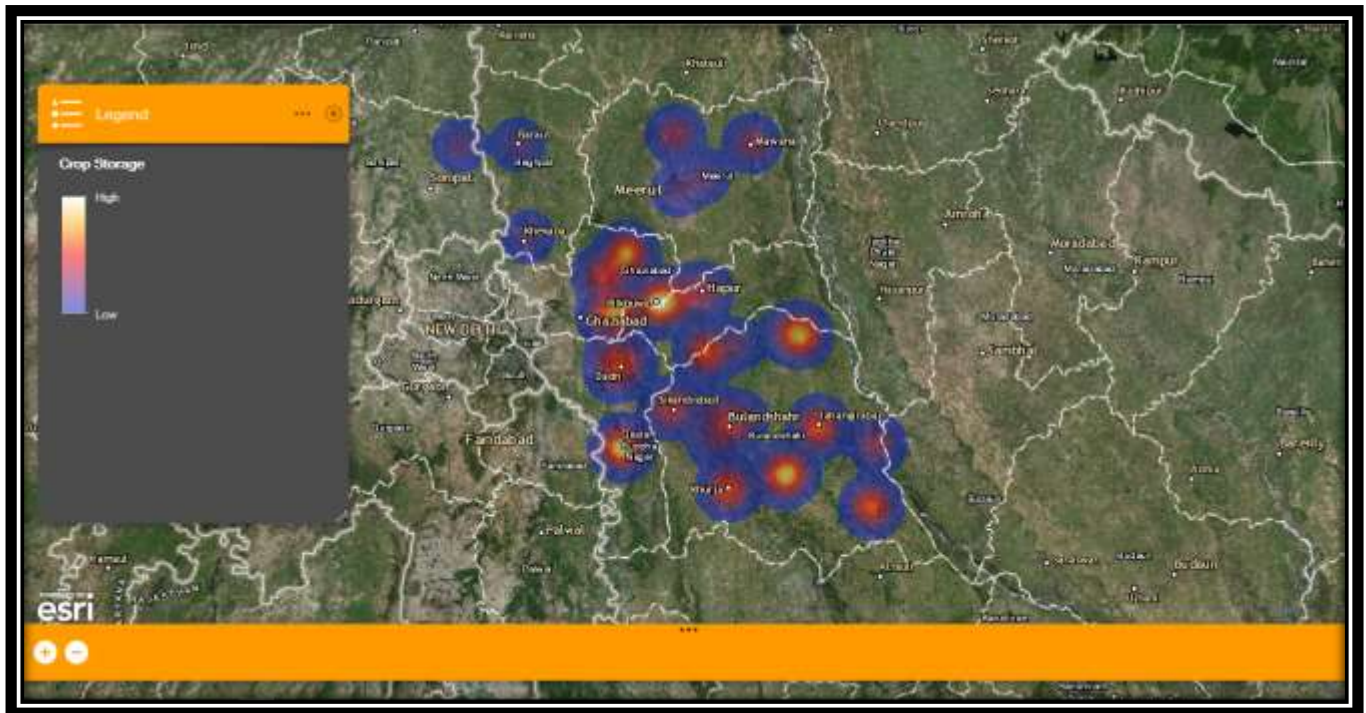


Fig: 2 – Crop Storage Density

After selecting the map area according to the preferred region, the user will find the screen like this as shown below in Fig.3:



Fig: 3 – Selected Crop storage by the user

Methodology

First of all, the user will get the main screen of the application. In this screen, the application will ask the user either to register or to login. For Login credentials, the new user has to register as a farmer or a dealer (as shown in fig.5 & fig.6).

The farmers will lie in two categories i.e. educated farmer and uneducated farmer. If the farmer is uneducated, then he need not register as a user. All the information of these farmers will be retrieved from the **JILA SAHKARI BANK SOCIETY**. If the farmer is educated, he will have to register as a farmer by entering his required information as shown in fig. 7. For the registration as a dealer, the user will have to register himself by entering the required information as shown in fig. 8. At the time of registration, the information entered by the user will be validated from the Aadhar database provided by the Government of India. Once the information is validated, that data will be stored in the individual database for farmer and dealer, of the application.

After registration is done, page will be directed to the home page i.e. admin page of farmers and dealers. Now farmers can query to dealers and dealers to farmers by app to app communication or via phone calls.

For the farmers to query dealers, farmers will retrieve the dealer's data easily from the database of the application. For the dealers to query farmers, the dealers will retrieve the farmer's data from **JILA SAHKARI BANK SOCIETY** through the database of the application. This process will be going on till the dealer and the farmer are satisfied with a good deal.

The other part of the application introduces the concept of "GIS (Geographical Information System)" that will help the farmers know about the crops they should be cultivating in that particular season and region with the factors of fertility of land, rainfall [9] in that season, temperature and altitude etc.

All the methodology described in the Fig. 4.

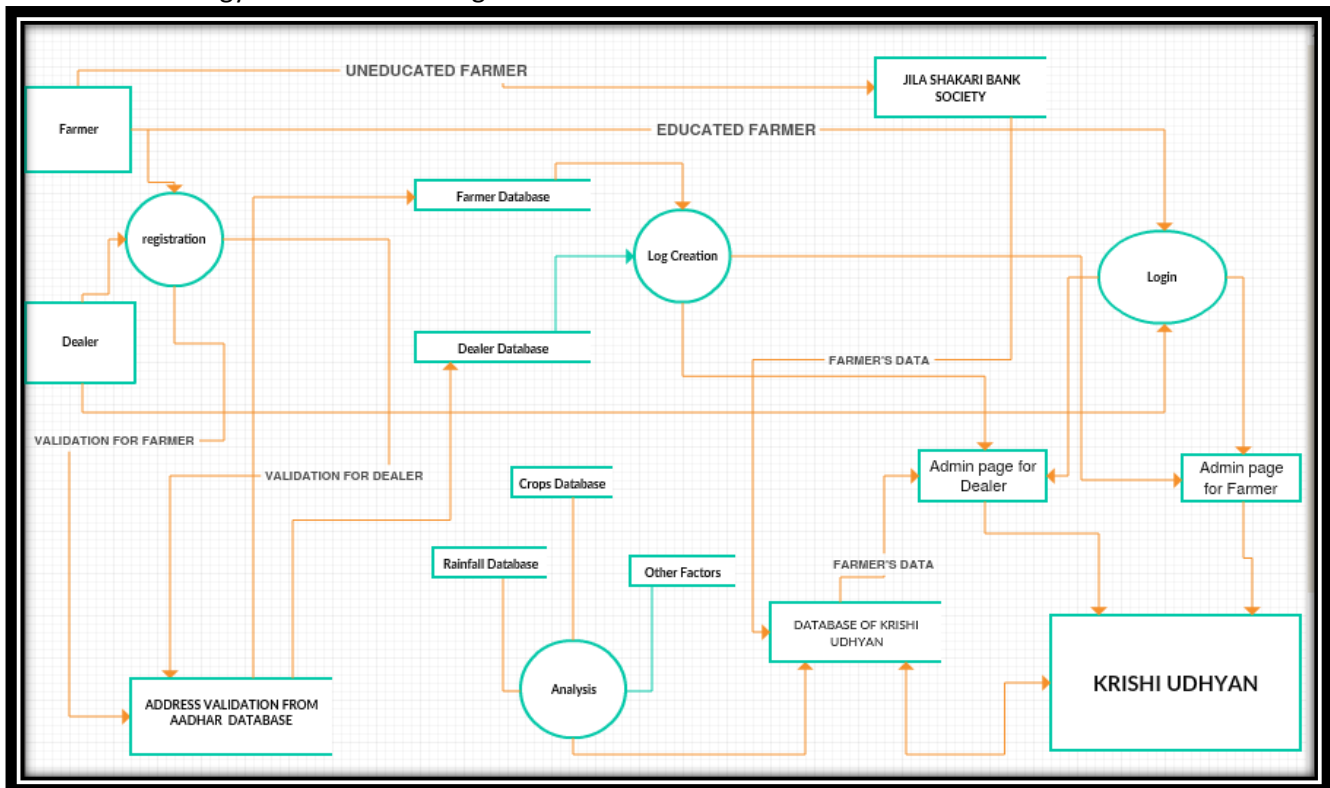


Fig: 4 – Data flow Diagram for Application

Result Analysis

After the development of application front-end view will be like this, as shown below.

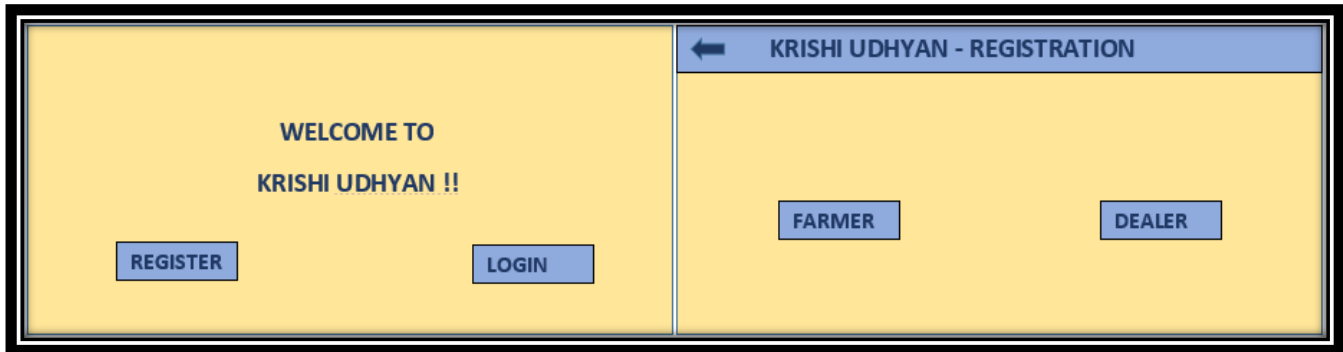


Fig: 5 – Front page of application

Fig: 6 – Registration page of KRISHI UDHYAN

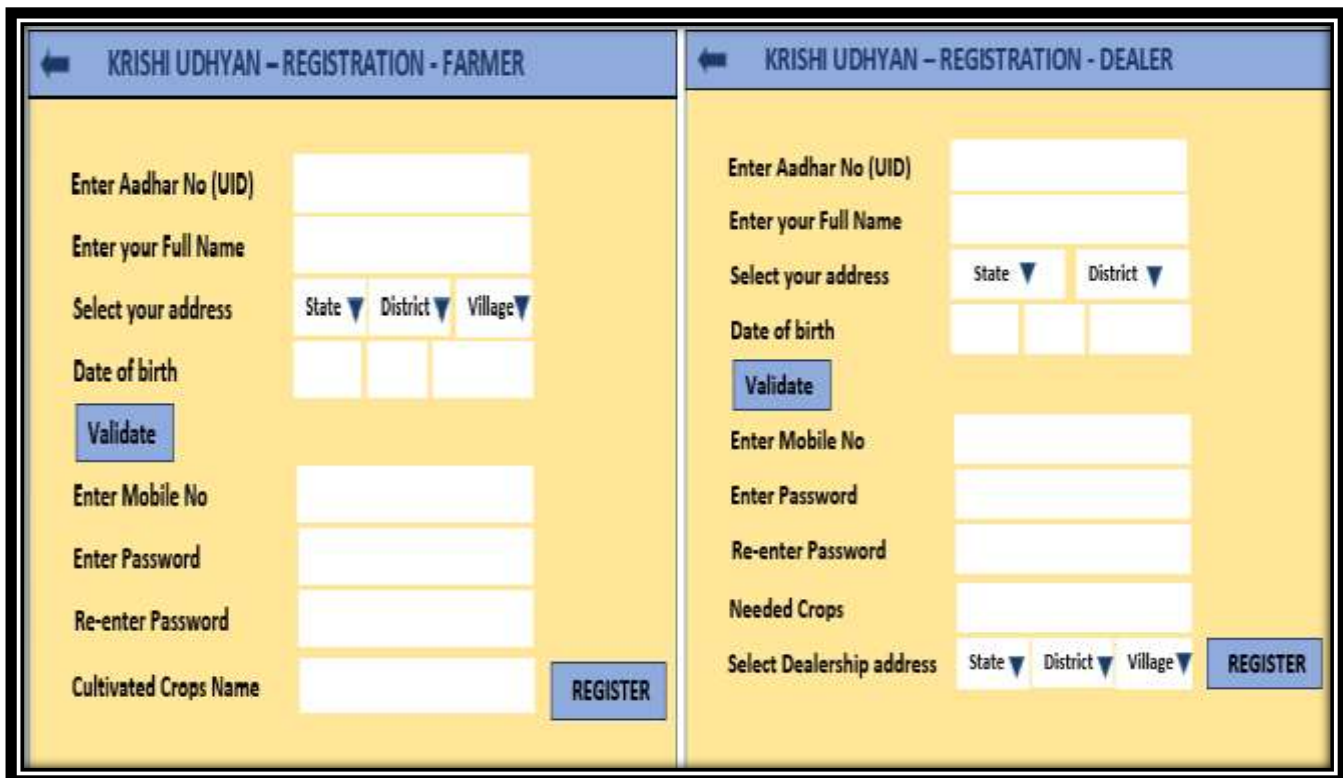


Fig: 7 – Farmer Registration

Fig: 8 – Dealer Registration

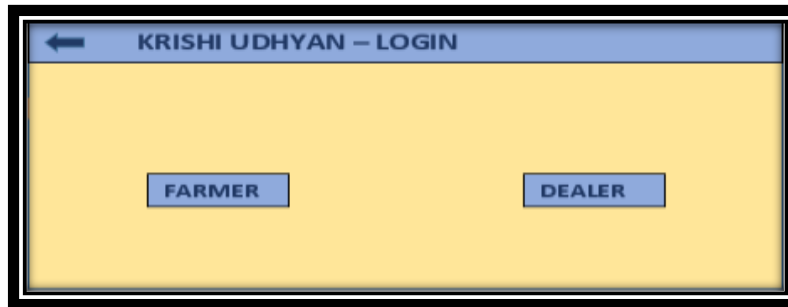


Fig: 9 – Login page of KRISHI UDHYAN

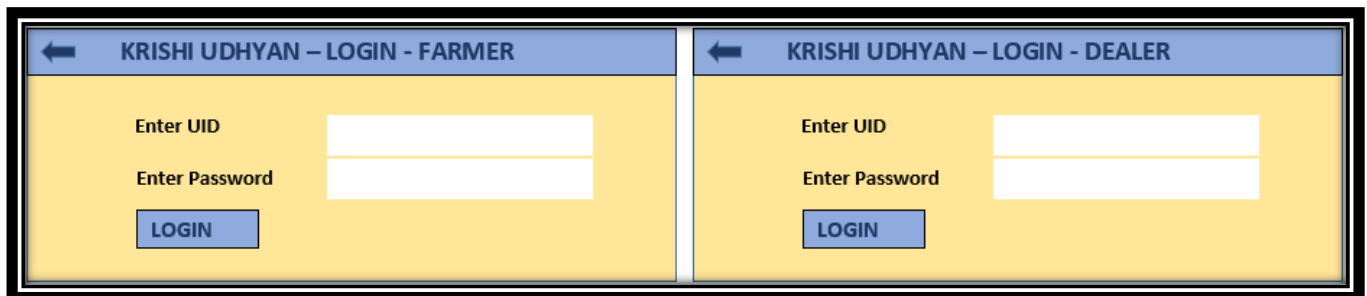


Fig: 10 – Login page for Farmer

Fig: 11 – Login Page for Dealer

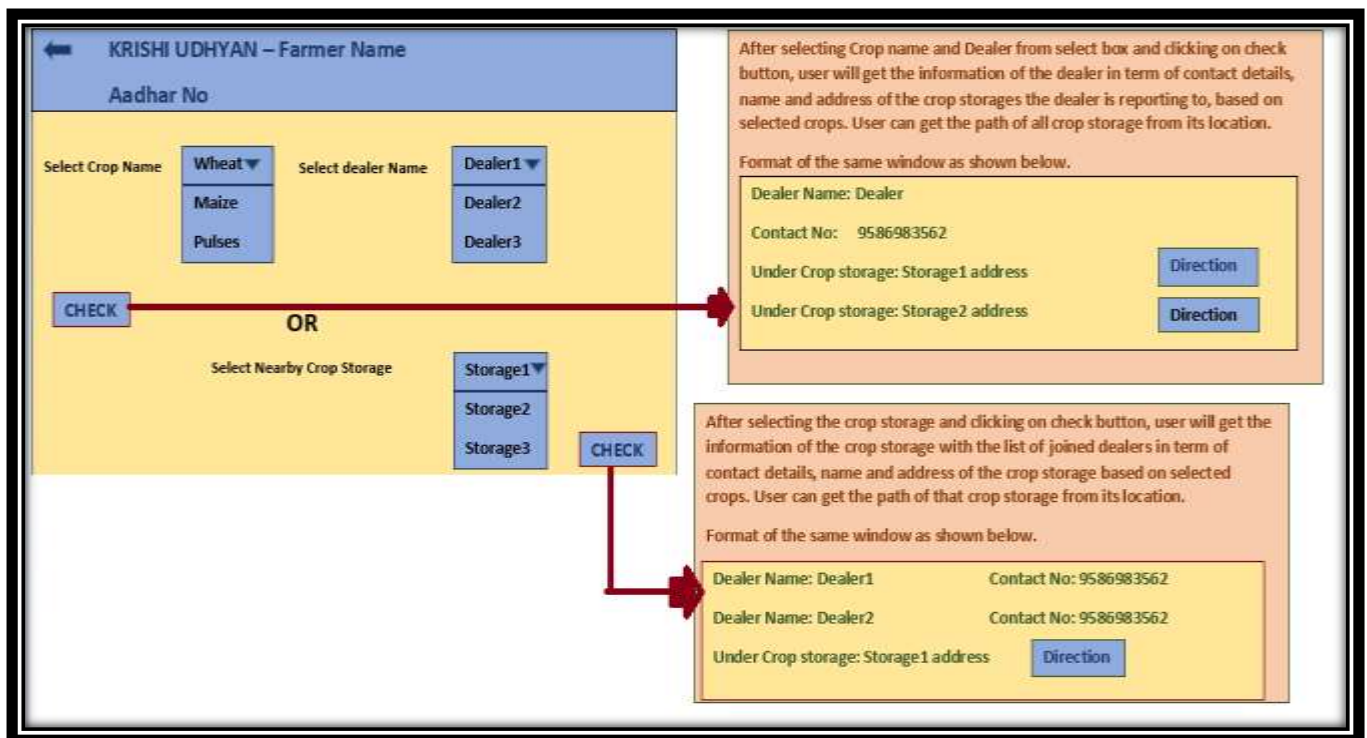


Fig: 12 – Admin page for Farmer after logged in

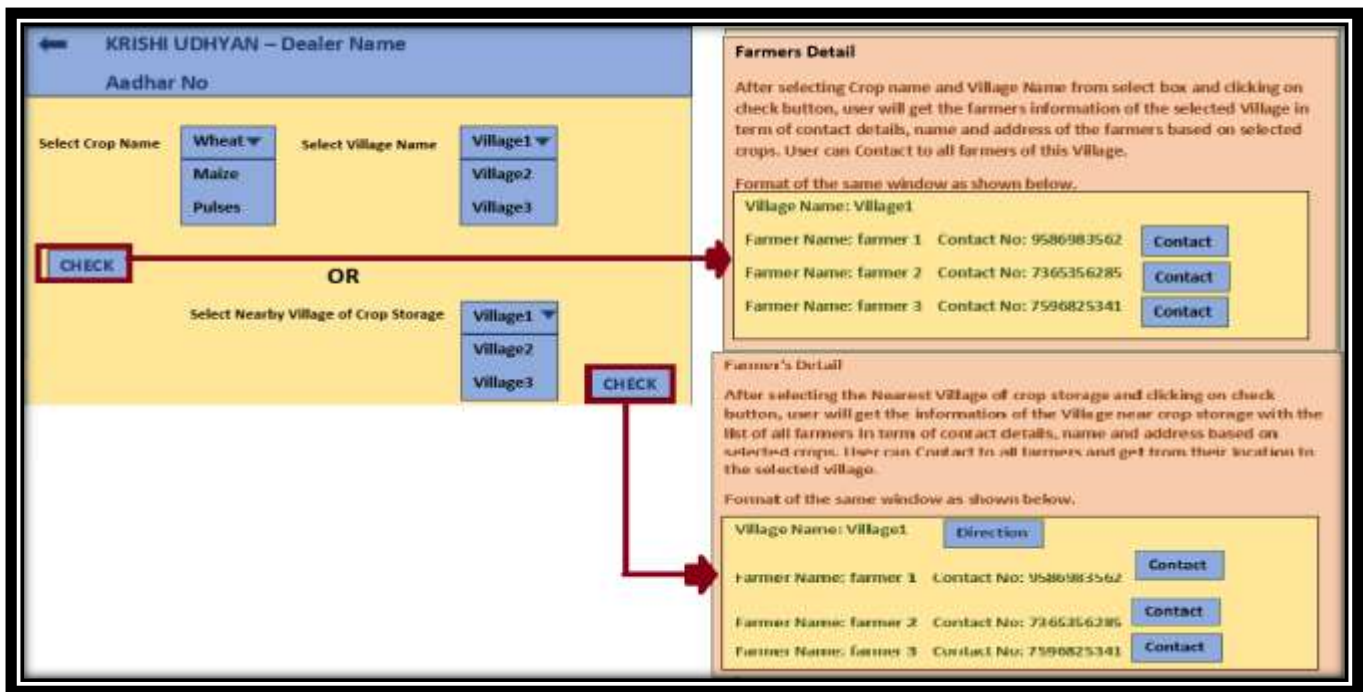


Fig: 13 – Admin page for Dealer after logged in

When the user will click on the direction button as shown in the fig.12 & fig.13, the user will be directed to the map of that area which the user initially selected, showing the nearby Crop storage locations in that selected region (as shown in fig.14).

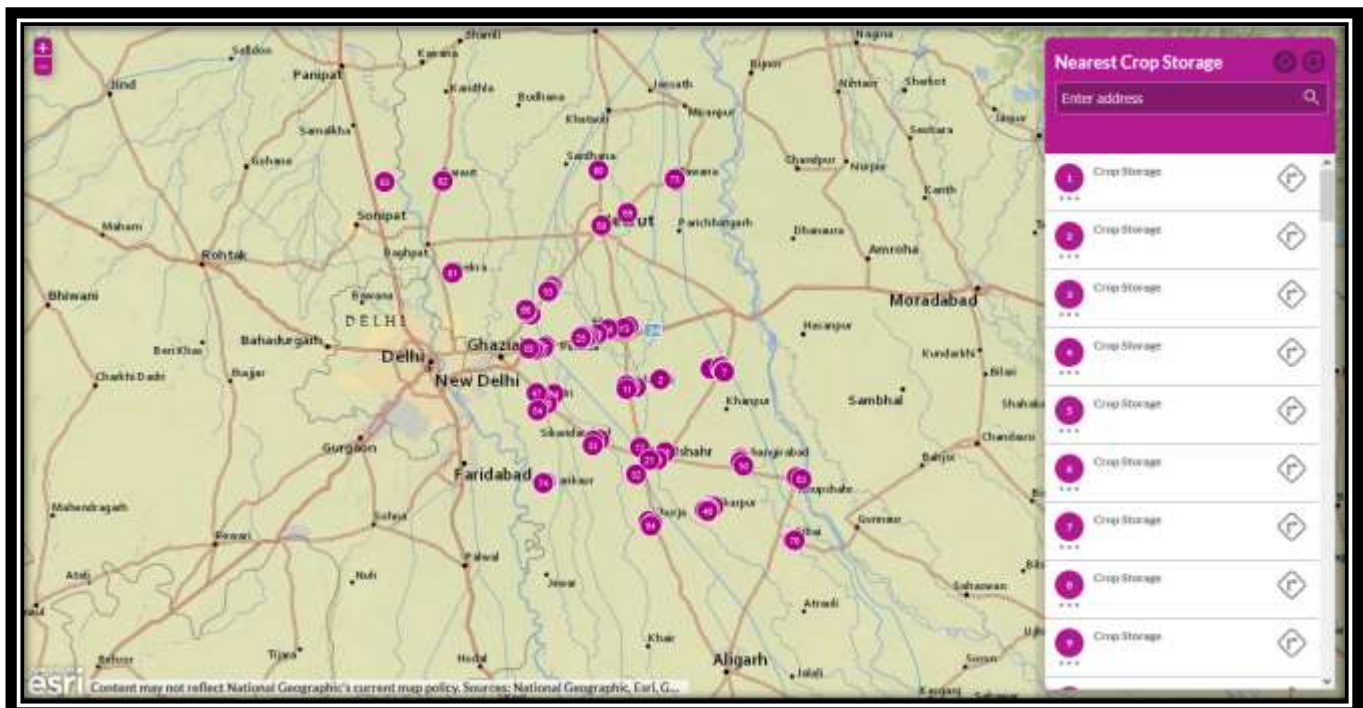


Fig: 14 – Nearest Crop Storage map of User location

Once the users get redirected to the map, now they can go through the following procedures.

- They can retrieve all the information about the crop storage like its owner details along with its associates (farmers or the dealers associated with that crop storage) by just clicking on that particular crop storage showing on the map (as shown in fig.15).
- From any random pre-known location they can get path from that location to the crop storage location just by clicking on the direction tab of any crop storage (as shown in fig.16).
- They can also get the path from their current location to the crop storage location just by clicking on the direction tab of any crop storage (as shown in fig.17)



Fig: 15 – Details of the crop storage selected by the user

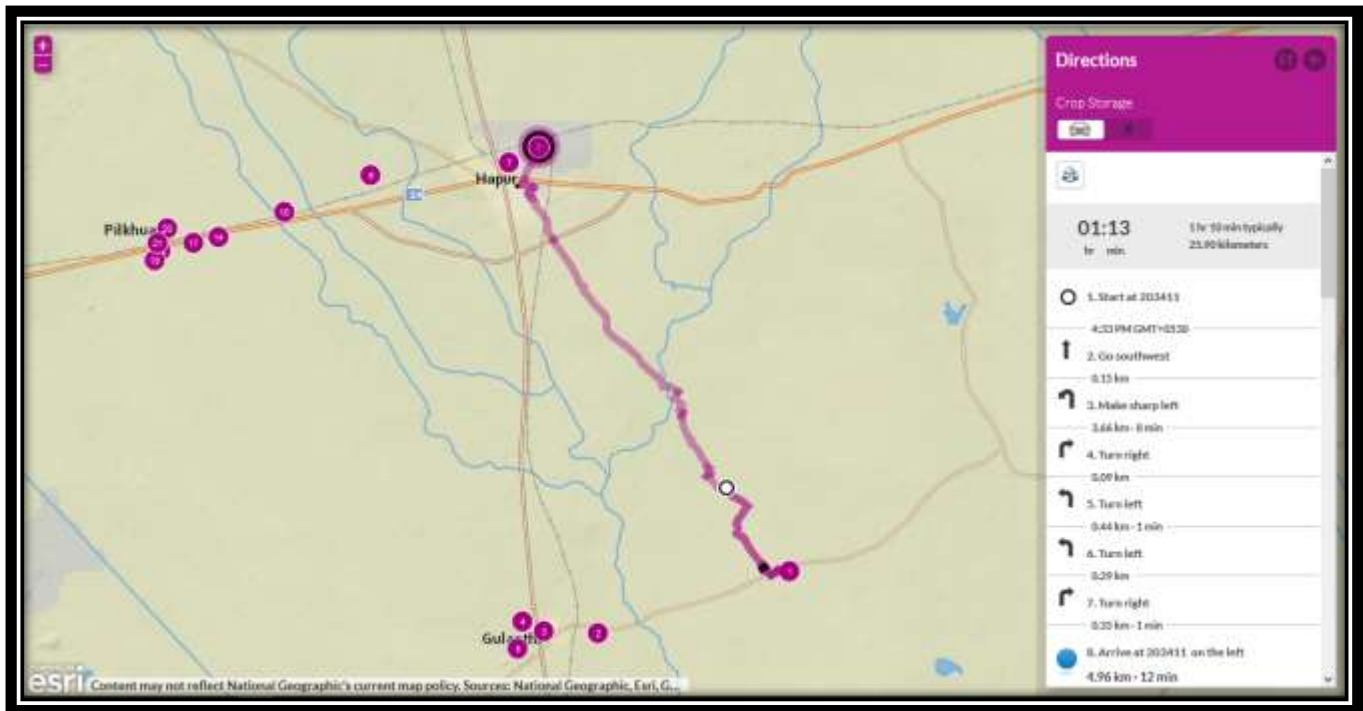


Fig: 16 – Path between random pre-known location to Crop Storage

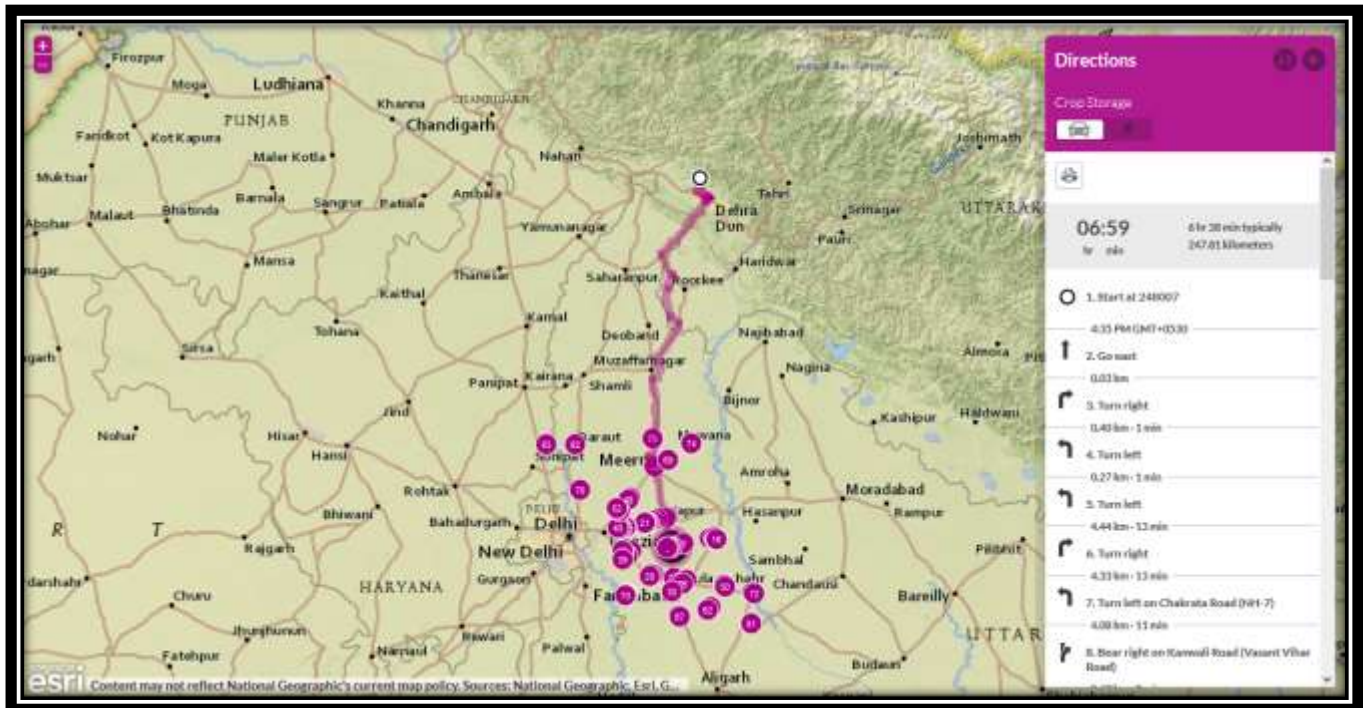


Fig: 17 – Path between current location to Crop Storage

Conclusion and Future Scope

After the successful development of this project; the project will be capable of providing a platform for the interaction between dealers and farmers. The quality of the crops sold by the farmers can be rated by the dealer which provides a suggestion or we can say an improvement towards the quality of crops farmers grow. The application will provide an optimized solution for the farmers' confusion of growing which crop in a particular region and season. In this Digitizing era, a Day will come when most probably all farmers will be using smart phones which will enable them to sell their crops directly to the dealer without any involvement of broker in between. The Key issue in the agriculture [10] fail i.e. the increasing no of suicide will surely be reduced. Also the problem of crops getting destroyed will be reduced through our advisory ability application.

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