# Pre-production Support for Agriculture through Information Exchange

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***Abstract*— *In agriculture, the prices of the products experience severe fluctuation. The farmers may be forced to sell their crops at a very low price. The proper study of the market and information exchange between the farmers make sure that the required crops are grown at required amount. The inflation and deflation can be balanced by proper analysis of the demand and the supply. The farmers and the Analytics Team can work together to bring a balance in the demand and supply of crops. The analytics team is a team of experts who have the data regarding the crop demand to make the accurate analysis for future. This information is shared with the farmers in an easy and understandable way through the mobile App. The farmers decide on their crop and registers the same in the app. This information exchange brings stability in the market demand and the supply.***

**Keywords**—Pre-processing, Agriculture, farmers

## I. INTRODUCTION

Agriculture is the backbone of Indian economy. About sixty five percent of the country's population depend on agriculture for their livelihood. Human ability to do agriculture is the basis of our civilization. The phenomenal process of transforming mud into food is agriculture. India has a history of over twelve thousand years in agriculture. India is the largest producer of many crops including pulses, rice, wheat, spices and spice products. Agriculture sector is always a major consideration in Central and State Government budgeting. Lot of facilities and support has been provided to the farmers by both the Central and State Government.

The life of the farmers who give us food is pathetic for many reasons like lack of education, poverty, lack of necessary infrastructure etc. Less than fifteen percent of the people show interest in farming. Over 3 lakh farmers have committed suicide in last twelve years.

Survey says that only less than five percent of the farmers want their children to do farming. Agriculture has become a heart breaking job. It is very important that farming be made an economically attractive process that youth will get engaged in farming. It will raise the standard of living in rural India. Organizing agriculture and bringing technology is very important to raise the agricultural standards.

Some farmers tend to follow traditional method of farming which includes growing the same crops from generations. The other set of farmers may analyse the market and sow the crops which are in high demand. The problem with this is that they may not be able to meet the demand of the market. The crops grown with high aspirations may exceed the market demand and famers end up getting less profit than expected.

Engineering technologies in farming can bring revolution in this field. Data capturing and analysing using IOT devices are gaining popularity. The information exchange between the agriculture experts and among the farmers can contribute a lot to bring stability in demand and supply of crops and hence a reliable profit to farmers. Proper crop planning by the Government and the farmers can help a lot to farmers and the consumers.

## II. RELATED WORKS

Crop survey agencies conduct survey to estimate the demand of crops and the availability of crops. Government uses this data to decide on the import and export duties for crops. Data mining technique is also used to estimate the crop requirement. The National Sample Survey Office (NSSO) takes responsibility of providing technical guidance to the States in developing suitable survey techniques for obtaining timely and reliable estimates of crop yield. The findings of the sample supervision are brought out in the form of State-wise reports for two major seasons and an All India Status Report titled "Review of Crop Statistics System in India through Scheme for Improvement of Crop Statistics". The status reports are exclusively sent to concerned state governments for effective and lasting improvement in the system of data collection and generation of quality statistics on crop estimates. Work related to planning of survey, compilation & analysis of data and publication of the reports is done at Agricultural Statistics (AS) Headquarters of NSSO (FOD) located at Faridabad.

## III. PROPOSED MODEL

Here we present a conceptual model of propsed system and various features invoved in it

### A. *High Level View of the model*

The data obtained from the survey Agencies are updated in the server on the cloud. The User or the farmer in this case registers himself in the system using the Andriod Application on his phone. The users fetche the data related to crop requirement as a whole which includes the number of acres registered by other farmers and the demand status for various crops. He then chooses the crop that has high demand in the market and registers the same on the server. Server updates the data and sends an acknowledgement to the user.

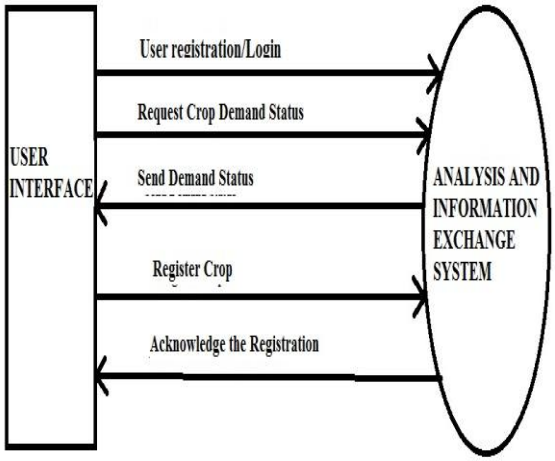


**Figure 1: Context Level Data Flow Diagram**

Figure 1 shows Context level Data Flow Diagram for the proposed system. User Interface is provided through Android Application on a smart phone. The Analysis and Information Exchange System contains business logic that resides on the Server in Cloud.

### *B. Demand Calculation Algorithm*

Any user is successfully registered if he enters his name, phone number, Aadhar number and his land area. After registering he can use his name and password to login to the application on his android phone. The application fetches data from the cloud and displays the demand(in acres) and the registered area(in acres) for each crop. The farmer can check the demand status for various crops and register his crop in acres. Now the farmers crop(in acres) will be subtracted from the previous demand to update the demand in the server. The farmer gets a message that his registration is successful. If farmer tries to register his crop whose requirement is already meet by other farmers, his registration will be successful with a warning "Threshold reached. Cannot guarantee Amount"

Below is the algorithm for the same

```
Step 1:
if(valid user)
        Register user in server.
End if
Step 2:
If (valid user)
        Login to application

End if
Display CropDemandSupplyData
Read crop
Register crop
demand=demand - crop
if(demand >= 0)
        Print "Crop registered"
Else
        Print "Crop registered. Threshold reached. Cannot guarantee Amount"
End if
```

## IV. RESULTS AND DISCUSSION

The application has been tested with 13 farmers and random inputs for demand and registration for paddy, sugercane, banana and pomogranate. The results are as tabulated.

Table 1: Total Demand of Crops and the Registeration of Crops

| Users | Crop | Demand (in acres) | Registration (in acres) | Result |
|---|---|---|---|---|
| User 1 | Paddy | 2500 | 250 | Registration successful Demand=2250 acres |
| User 2 | Sugercane | 7000 | 100 | Registration successful Demand=6900 acres |
| User 3 | Banana | 300 | 7 | Registration successful Demand=293 acres |
| User 4 | Pomogranate | 220 | 70 | Registration successful Demand=150 acres |
| User 5 | Sugercane | 6900 | 72 | Registration successful Demand=6828 acres |
| User | Bana | 293 | 40 | Registration |

| | | | | |
|---|---|---|---|---|
| 6 | na | | | successful Demand=253 acres |
| User 7 | Paddy | 2250 | 36 | Registration successful Demand=2214 acres |
| User 8 | Suger cane | 6828 | 22 | Registration successful Demand=6806 acres |
| User 9 | Banana | 253 | 70 | Registration successful Demand=183 acres |
| User 10 | Banana | 183 | 200 | Registration successful Cannot guarantee amount Demand=-7 acres |
| User 11 | Pomogranate | 150 | 100 | Registration successful Demand=50 acres |
| User 12 | Banana | -7 | 30 | Registration successful Cannot guarantee amount Demand=-37 acres |
| User 13 | Pomogranate | 100 | 102 | Registration successful Cannot guarantee amount Demand=-2 acres |

Table 1 shows the Total Demand of Crops and the Registeration of Crops and the Acknowledgement that user recieves after successful registration.

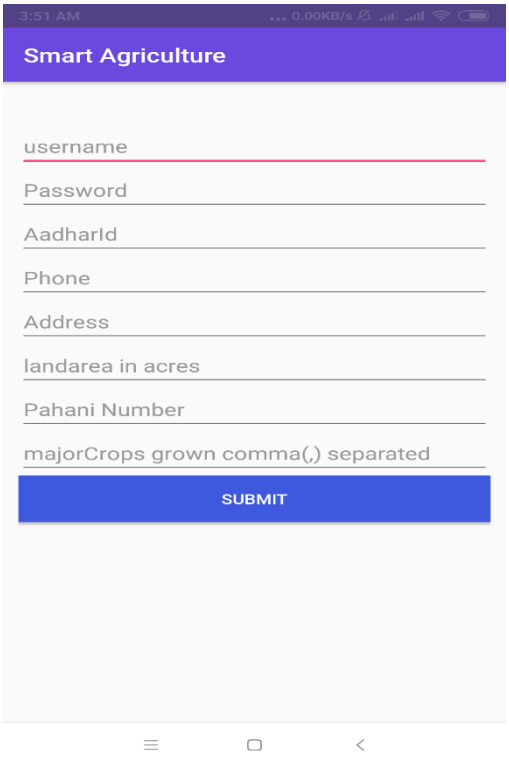


**Figure 2: Registration Page in Android Application**

Figure 2 shows the registration page for the first time user of the application. Once he successfully registers he can access the application using username and password.


**Figure 3: Application listing the total demand and registration information for each crop**

Figure 3 shows list of the total demand and registration information for each crop. User can

check the demands for various crops and choose the one with high demand to get maximum profit.

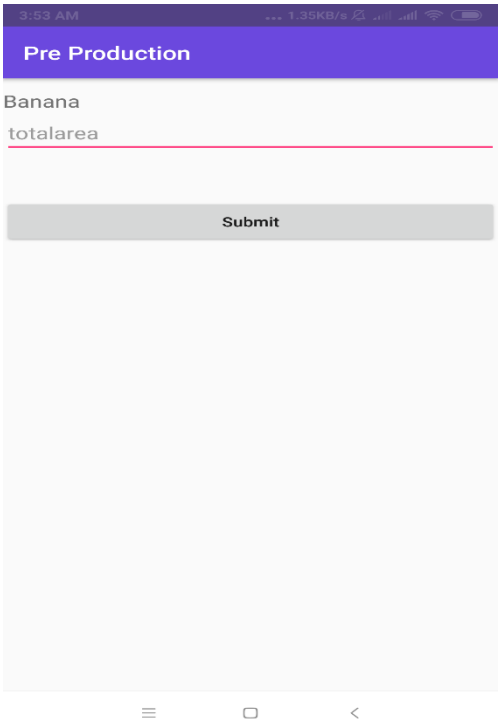


**Figure 4: Android Page to register the crop**

Figure 4 shows the android page through which user can register the crop he decides to grow. The crop registered (in acres) will be subtracted from the total demand of the crop.

## V. CONCLUSION

The proposed model works great to bring stability in inflation of crops. It assures the farmer that the crop will be in demand at the time of harvesting. It bings a lot of secured feel for the farmers, helps the society byreducing the inflation rates. The crops will be sold at standered price through out the year which helps the society as well.

The accuracy of the result increases with increse in number of users. Encouraging crores of farmers to make use of technology is time consuming and it may take years for its success. Once the famers come forward sportively to register their crops, this system will bring revolutionary advancement in the field of farming.

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