



## VOICE FOR RURAL

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**Abstract:** This work is based on the development of rural areas. It consists of three modules : 1. discovery of suitable data models that aid in the achievement of high accuracy and generality in price prediction. 2. Farmers' labour is made easier and more efficient by modern agricultural equipment. As part of this, certain organizations have been established to assist farmers in need of such equipment, where the group owns the equipment and rents it to farmers at reasonable rates. 3. The primary goal of those living in rural areas is to find solid, well-paying jobs. They believe that obtaining employment chances will allow them to maintain their living standards in a suitable manner. The main objective of this paper is to acquire an efficient understanding of employment opportunities, in which rural people are engaged.

**IndexTerms-** Data Analytic, Prediction, Machine Learning, Linear Regression, Decision Tree, Employment Opportunities, Development, Income, Progression

### I. INTRODUCTION

A. Farmers have found it difficult to plan crops for the following season since it is impossible to forecast metrics of pricing that their produce would fetch in a given season, which is often depending on dynamic weather circumstances. [1] This causes farmers to make false crop price predictions, causing them to choose the wrong crops or sell their crops early without storing them, earning less than what the same crop would have earned them in the future [10]. [3] This problem could be solved by an ML model that predicts crop prices in advance by analyzing the crop and presenting a future scenario so that farmers can choose the right crops to strategize crop production, which includes crop selection, sowing time, crop pattern, and harvest storage, all of which provide enough information to predict the appropriate market price.

B. Agriculture has been pressured by exponential population increase. The size of agricultural land is shrinking, while the requirement to feed an ever-increasing number of mouths is growing. Food productivity has been further harmed by natural and man-made factors. [10] Machines are used to carry out agricultural tasks in order to maximise efficiency and productivity. Agriculture productivity cannot be increased unless machines are used to their full potential. Unfortunately, in most regions of the world, including some portions of India, the usage of farm machinery is still under discussion. The research in question looks on the importance of tool sharing and rental in the workplace. [10] Rental and sharing equipment are two methods that farmers could utilise to borrow equipment at a lower cost than they would have to pay for it otherwise.

C. One of the greatest hurdles that rural residents have faced is the inability to create a large drop in the agricultural labour. Individual participation in other duties and activities is one of the key causes of this. Currently, rural people are relocating to metropolitan regions in order to find work and improve their living situations.

### 1.1 PROPOSED SYSTEM

A. It will be a website that farmers may access to help them choose their chosen crop based on their financial situation, necessity, feasibility, and other factors. Multiple crops will be widely farmed throughout the country. The dash will display the top and poorest performing crops, as well as the percentage by which they are rising or behind. Predictions will be made for the next 12 months. We are developing the Crop Price Prediction Website for crop forecasting, in which we will take data from the government for 20+ crops and present it in a structured manner, showing the increase and decrease in crop prices per month, as well as crop details such as type, location, and export factors, to make it easier for farmers to plan and manage their finances and sown/harvesting accordingly. We will also present data in the form of pie charts and graphs. It offers a user-friendly UI and predicts using decision tree regression. We do an in-depth statistical study of past data in order to provide a refined platform for interaction that farmers can use to make predictions for the next 12 months. To begin, an updated dataset will be obtained from data.gov.in, which will include rainfall and wholesale prices for each crop month by month. The model will be trained and then appropriately appraised after the necessary pre-processing. If the frontend and backend are confirmed to be suitable, the ML model will be installed at the backend. The dataset model will be updated as needed and redeployed in a timely manner. We're doing supervised learning here since we have many

inputs, an output, and we're trying to figure out how they're related. The two options suited for this are linear regression and decision tree regression because both can predict a range of values (continuous) based on numerous inputs, and we chose decision tree regression because there is no linear relationship between the inputs and outputs in the supplied dataset. The algorithm will be fed the following data: The input parameters (months, year, and monthly rainfall), as well as a Jupyter notebook for ML model training and Visual Studio for frontend and backend development. Data intake is the process of combining data from numerous sources. Injected data must be prepared according to the system's specifications. The prepared data will be used to develop and train the Machine Learning model. Standard metrics will be used to evaluate the model. Retrain the model if the results do not meet the requirements. Deploy the system once the expected outcomes have been achieved.

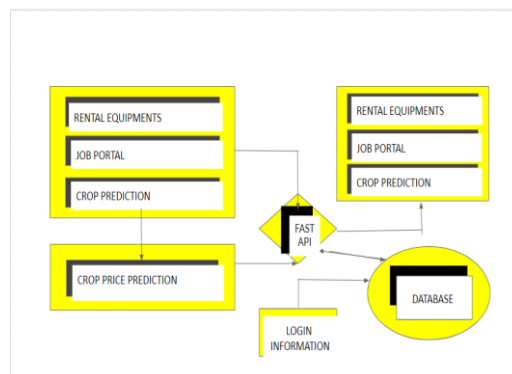


Fig 1 : Workflow

## 1.2 HARDWARE AND SOFTWARE REQUIRMENTS

1. Jupyter notebook for training ML model and Visual Studio to develop frontend and back- end.
2. Python:
  - Flask: It's a web framework used for backend development for the website and linking to html pages using predefined functions.
  - Pandas: To be used to read the dataset and split it into independent, dependent variable and training and testing set
  - NumPy: To shape the data as an array
  - Scikit learn: To use regression algorithms
  - Matplotlib: To plot the decision tree model for visual analysis
3. HTML to define the content of web pages
4. CSS to specify the layout of web pages
5. Java Script for scripting and programming the behavior of web pages
6. csv files to store dataset.
7. Chart.js for flexible graphical presentation.

## 2. LITERATURE SURVEY

### A. Crop Price Prediction:

There is no mechanism in place to advise farmers on which crops to cultivate in order to predict costs. As a result, we attempt to forecast the crop price that a farmer can earn from his property in this study by evaluating pricing patterns in historical data. We also provide a time series analysis of the price and gain over the future twelve months based on the last twelve months. Farmers have issues before, during, and after the crop cycle, such as determining the best feasible pricing and covering both weather and market-induced risks for product. This study will assist farmers in strategizing agricultural production, which includes crop selection, sowing timing, crop pattern, and harvest storage.

This also intends to assist people in agricultural and related professions in strategizing their raw material procurement strategies, and it is designed to be very user-friendly.

### B. Agricultural Rental Equipment:

[10]Modern agricultural equipment makes farmers' jobs easier and more efficient. As part of this, certain organisations have been established to assist farmers in need of such equipment, where the group owns the equipment and rents it to farmers at reasonable rates. Farmers currently have to travel to a location to borrow all of their fundamental necessities, which is a time-consuming and inefficient task. In the current Global Opportunity report, smart digital farming is ranked as the highest-ranking technology opportunity in terms of projected positive impact.

### C. Job Portal:

It is critical to provide work opportunities, particularly in rural areas, for the impoverished and socioeconomically backward parts of society. In addition to job opportunities, there are measures and initiatives in place that are assisting in improving their general quality of life. Employment options help to enhance productivity and serve as a medium for redistribution of national revenue from a development standpoint. The programs that would assist the rural population to obtain work prospects were not

taken into account in the various plan documents. This is seen as one of the main reasons why rural people are still unemployed and living in poverty.

### 3. ARCHITECTURE

Web application architecture describes how apps, middleware frameworks, and databases work together to ensure that diverse applications can function together. The browser loads that exact web page when a user types the URL and pushes "enter." At that time, the server responds by delivering data to the browser. Following that, the programme sends the requests to the client. The client now has the opportunity to connect with the website. These actions are obviously completed in a matter of seconds. For the client side, usually used languages are CSS, Javascript, HTML etc.

Web application features include:

1. Sending data across HTTP to a client-side interface that can interpret it and vice versa. Assuring that requests contain accurate information. Permission-based visibility limits the visibility of users. Allows users to authenticate themselves. Data is created, modified, and deleted.



Fig.2 : Home Page

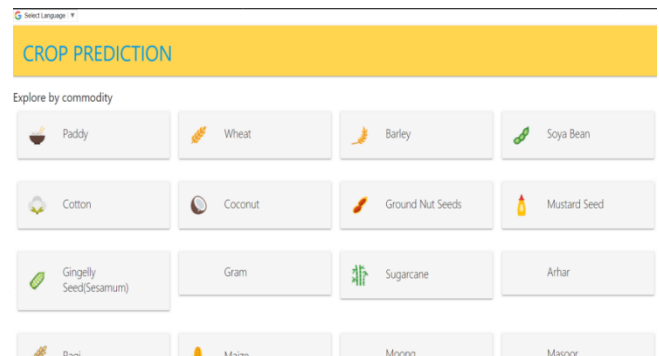


Fig.3: Crop Prediction Page

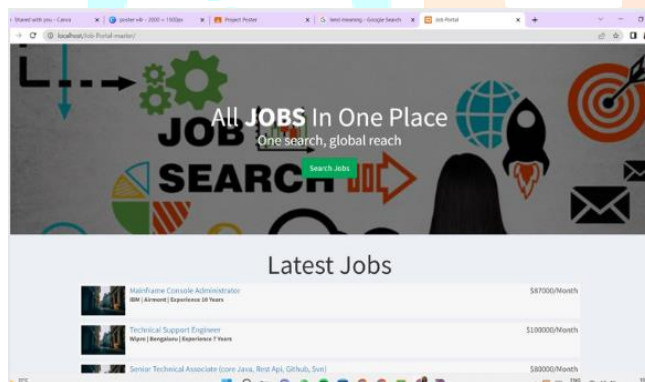


Fig 4 : Job Portal Page

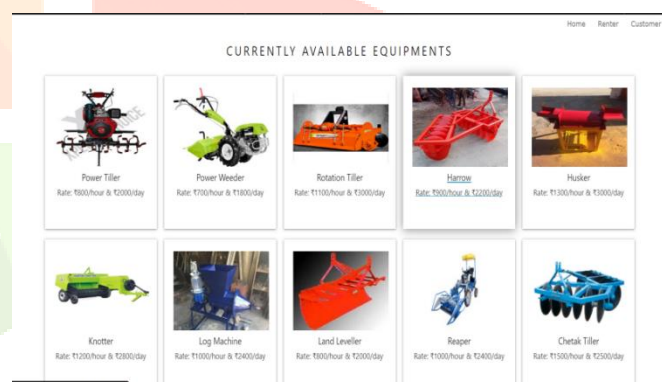


Fig 5. Rental equipments page

### 4. DATA PRE-PROCESSING:

It is a method for converting a given raw dataset, which contains undesired qualities and missing values, into a processed dataset, which is the dataset acquired after working with the raw dataset.

A. Algorithm Selection:

Decision Tree Regression:

The dataset will be divided into multiple leaflets which are the result of multiple decisions of yes and no and then the new data will be calculated based on what leaflet they land and then calculate the average of that leaflet.

Random Forest Regression:

It is based on ensemble learning, which states that we can construct a superior algorithm by combining multiple algorithms or the same algorithm numerous times. To generate the output, Random Forest employs numerous decision trees. We now have a large dataset on which to train numerous decision trees. Now that the testing data has been delivered to each of the decision trees, they will provide output based on their own preferences, and the entire collection of output will be averaged.

Training and Testing:

The dataset is divided into two categories: training and testing. 80% of the time was spent training the dataset and 20% of the time was spent testing it. Our machine learning model will try to understand and learn on its own before being tested using the test dataset.

## 5. RESULT AND DISCUSSION

### Crop Price Prediction:

The research intends to create a farmer-friendly interactive website that predicts price and forecasts through a web application that is powered by efficient machine learning techniques and technologies and has a user-friendly interface. As we take rainfall as a consideration, we may also include temperature, soil fertility, and regional use, based on how crop output varies from area to area, and so a better forecast model can be developed.

### Rental Equipment's:

The online administration framework for Agri-Equipment rental was created to ensure the efficient operation and management of a government-backed agricultural hardware rental company. It decreases the amount of manual labour required. It eliminates paperwork, resulting in a more sustainable environment. It also saves time. Additionally, proper documentation of the entire project is provided so that anyone can understand it and make essential adjustments if necessary. This programme can be enhanced in a variety of ways and expanded to accommodate a variety of devices. Here are a few examples of possible extensions: Analytics can be enhanced so that the farmers can see which regions demand which machinery and move to that spot ahead of time. Crops and fertilisers have been added to the list. Inclusion of GPS and maps to aid in determining the equipment's present locomotion state.

### Job Portal:

The wider areas of job searching facilitate the quick and easy access to opportunities. The increasing job opportunities and changing scenario of the business environment today has made more people to search for better career and employers to search for better potential. Job Search Portals stands as a revolutionizing element in the sphere of recruitment. They act as a communication bridge between applicants and recruiters facilitating their requirements. This application helps organizations to have a greater exposure to the candidate pool and also job seekers facilitating wide search of jobs matching their interests. T

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