VALUE OF FARMERS

TRANSFORMING AGRICULTURE PRODUCTIVITY

White Paper Glance

Version:1.9

VALUE OF FARMERS (VOF)

FOR

INDIAN AGRICULTURE INDUSTRY

ABSTRACT

As we know, Agriculture domain is vast and spread across the world. It is practiced as foundation of economy in almost all countries. In this context we have taken the pilot project in context with Indian Agricultural Ecosystem as it is one among the top agricultural countries.

As per information from government sites, almost 59% of population are based on agriculture. Geographically India is covering maximum land share in the world for agriculture purposes. India has good cultivating land with necessary farming conditions and environmental climate.

But still India is not contributing significantly to its GDP value from agriculture field. It's on 7th position as compared to other countries GDP agriculture contribution in the world. There is a huge potential to optimize this area to upscale it to next level.

Since Government of India is taking strong and long-term initiatives towards Agriculture Improvement and leaving no stones up turned to take necessary steps to implement digital techniques in all fields. VoF offers it's support to government initiatives on penetrating the agriculture advancement in villages by the use of technology.

By researching the entire scenario, we are determined to bridge the gap between end-users and farmers in a Peer to Peer mode by offering solutions under one roof – VoF mobile App which is easy to use and user-friendly and utilizes emerging futuristic technologies.

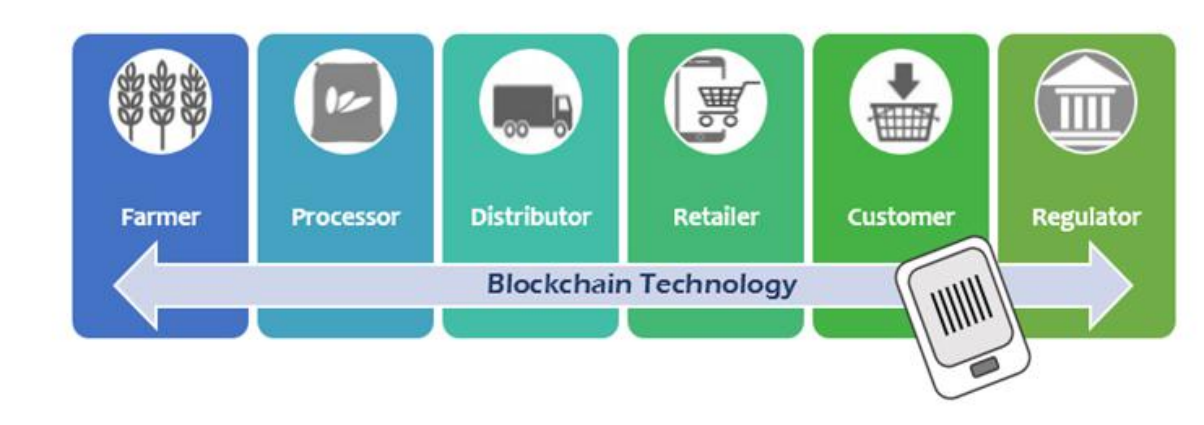
OBJECTIVES

- Increasing farmer's profitability and margins
- Government schemes penetration at grassroots level

- Balanced amalgamation of traditional and technological driven farming
- Eliminating middlemen by use of technology to provide information to increase farm yield
- Better and competitive market place for everyone for transparent P2P trade
- Ensuring optimum utilization of farm for precision farming by empowering farmers with data and analytics
- Skilling the farmers using accessible and user-friendly tools
- Adding transparency to the complete farming ecosystem benefitting everyone from farming fraternity

VISION

- Offering solutions to support government initiative to help farmer increase profit margins implementing best practices.
- Offering single window solution to farmers through easy and assessible one mobile app for complete ecosystem connectivity
- Connecting stakeholders of farming ecosystem in a transparent P2P mode



PROBLEMS FACED BY FARMING COMMUNITY

(A) Quality of Manures, Fertilizers and Pesticides

Nearly 80% of the 140 million farming families in India hold less than 2 acres of land. Small land holdings restrict the farmer to use traditional methods of farming and limit productivity.

As land holdings are small, more people invariably work on the farms in the rural areas and coupled with the obsolete technology. Due to these issues the collective farm incomes come down.

(B) **Quality of Seeds**

Distribution of assured quality seed is as critical as the production of such seeds. Unfortunately, good quality seeds are out of reach of the majority of farmers, especially small and marginal farmers mainly because of exorbitant prices of better seeds. The is scarcity of affordable seeds with good quality.

(C) **Quality of Soil**

Indian soils have been used for growing crops over thousands of years without caring much for replenishing. This has led to depletion and exhaustion of soils resulting in their low productivity. This further leads to decrease in the yield per hectare of land.

COUNTRY	PRODUCTIVITY (per hectare in kg)
USA	7638
CHINA	5886
BRAZIL	4640
INDIA	2984
RUSSIA	2444

(D) **Lack of Mechanization**

Little or no use of machines happens in multiple steps of farming process like ploughing, sowing, irrigating, thinning and pruning, weeding, harvesting, threshing and transporting the finished yield either to marketplace or cold storage.

This is specially the case with small and marginal farmers. It results in huge wastage of human labor and in low yields per capita labor force.

(E) **Lack of P2P Agricultural Market**

The Rural Credit Survey Report rightly remarked that the producers in general sell their produce at an unfavorable place and at an unfavorable time and usually they get unfavorable terms.

According to an estimate 85 per cent of wheat and 75 per cent of oil seeds in Uttar-Pradesh, 90 per cent of Jute in West Bengal, 70 per cent of oil-seeds and 35 per cent of cotton in Punjab is sold by farmers in the village itself at inadequate prices. Such a situation arises because hand to mouth household farmers cannot wait for long after harvesting their crops.

(F) **Inadequate Storage Facilities**

The Parse Committee estimated that the post-harvest losses are 9.3 per cent in total, of which nearly 6.6 percent occurred due to poor storage conditions alone. Scientific and affordable nearest storage is, therefore, very essential to avoid losses and to benefit the farmers and end-users.

(G) **Inadequate Transport & Supply Chain**

One of the main handicaps with Indian agriculture ecosystem is the lack of cheap and efficient and easily available means of transportation. Even at present, in the age of technology, there are thousands of villages which are not well connected with main markets or market centres.

(H) **Scarcity of Capital**

All India Rural Credit Survey Committee showed that in 1950-51 the share of money lenders stood at as high as 68.6 per cent of the total rural credit and in 1975-76 their share declined to 43 per cent of the credit needs of the farmers.

There has been acute shortage of agencies / institutions, offering capital to farmers for farming, buying necessary equipment, seeds, fertilizers and related stuff. Also, there are very few start-ups in agricultural capital market to help.

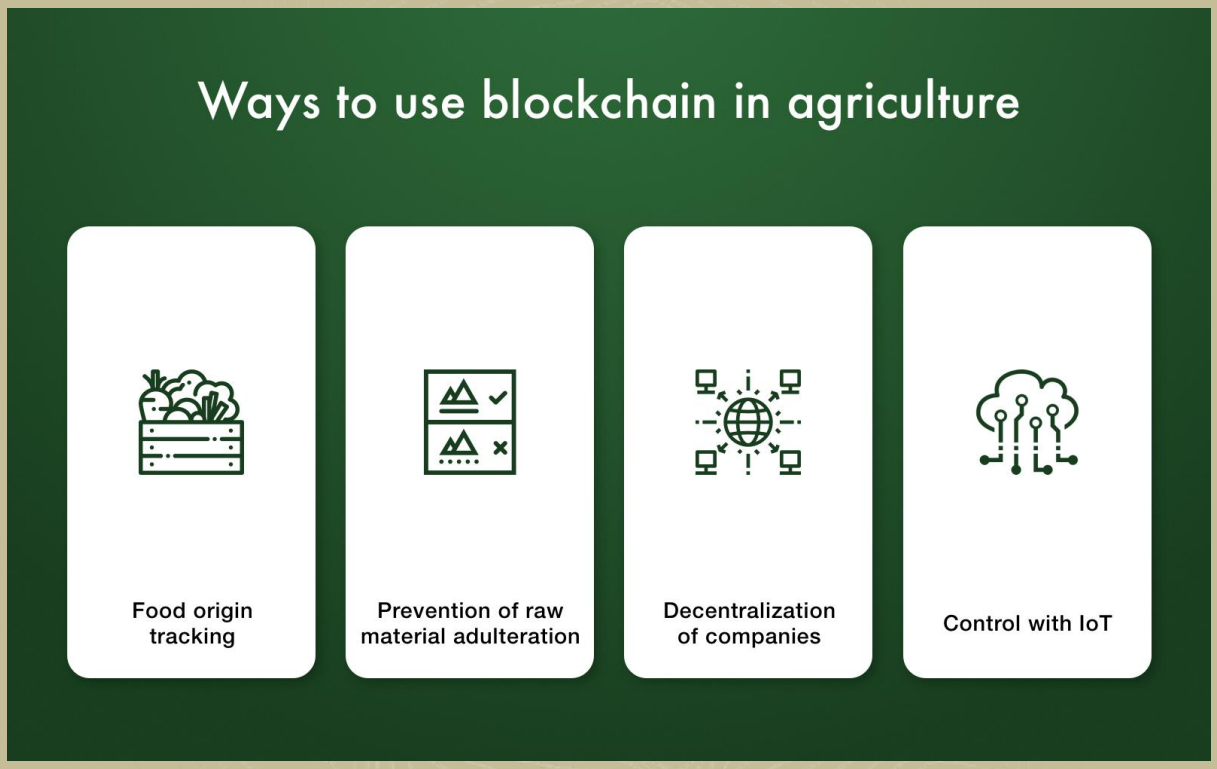
(I) **Lack of Skilled Labour**

The Indian farming ecosystem is also suffering from acute shortage of skilled labour and manpower throughout the cultivating process. The farmers are not able to find nearest manpower available at affordable cost.

(J) **Lack of Technology Infrastructure**

As report from different surveys the Indian farming ecosystem is also suffering from acute shortage of technology infrastructure throughout the farming process.

SOLUTIONS USING TECHNOLOGY



Working under the guidelines of **Pradhan Mantri Krishi Yojana**, VoF is proposing online solutions for precision farming to increase the agricultural yield per hectare. VoF is in-lined for the Government of India initiative **'per drop more crop'.**

VoF is offering a mobile based App which offers solutions to multiple requirements of farmers starting from buying of seeds to their yield value offerings and settlements after their crops are sold. The solution will be offered on our app. An added advantage will be offered to the farmers regarding their data of Soil, Crop, Weather, Farming Practices, and other information using

Data Analytics and Machine Learning technique. This data will be made available to the farmers in a user-friendly interpretable format.

Developing Farming Ecosystem:

VoF also outlines to support multiple economies in their initiative of global food security by connecting markets with rural communities. With its tech platform for sustainable food supply chains it is focused to create self-sustainable farming ecosystem from soil to shelf.

Reducing Farm Workers Migration:

Seasonal migration for work is a pervasive reality in rural India. An overwhelming 120 million people or more are estimated to migrate from rural areas to urban labour markets, industries and industrial farms.

Migrants form the largest part of India's vast unorganized work sector. The contribution of migrant workers to national income is enormous but there is little done in return for their security and well-being.

There is an imminent need for solutions to transform migration into a more dignified and rewarding opportunity. VoF has planned to empower these seasonal migrants by providing it’s in-house designed “agricultural specialist” training program to become ‘Krishi-Tadnya’. This program by VoF will create competent agricultural professionals opening altogether a new employment opportunity for educated youth of villeges.

Data Driven Best Practices and Optimization:

VoF provides real-time status on the farming condition of the farms for which it receives data, increasing the efficiency along the supply chain from farm to shelf, enabling highly accurate impact measurement.

The platform will try to offer cooperatives and agencies a continuous flow of data on the progress of farmers on the network, enabling them to optimize their sourcing and minimize food waste in the overall process.

The comprehensive data assessment and insights that VoF offers for farmers, combined with the records of all subsequent transactions, enable the farming ecosystem stakeholders to trace impact in real time, down to the individual level.

Step by Step Process:

The overall process of offering solution will be further divided in to a step by step approach. It will involve all those steps which should be done by farmers / co-operatives before seeding.

1. Soil Testing

Working in accordance to initiative of **Government of India** to issue **Soil Health Card** for farmers, every 3 years, to all farmers of the country, so as to provide a basis to address nutrient deficiencies in fertilization practices. It is generally done by Soil Testing Laboratories **(STLs), Indian Council of Agricultural Research (ICAR) / State Agricultural Universities (SAUs).**

But it has many challenges. To make it hassle free and more user friendly, VoF will be offering an App which will offer and utilize data and API of government online resources.

Here by using Machine Learning technique on these collected data, VoF will be able to give suggestions and predictions and data analytics, that according to the current weather condition and location "which crops can be sown to farmlands with exactly what add-ons."

VoF will try to combine soil data, plot size, input costs and food market forecasts to calculate ROI for each available crop before planting. This reduces the age-old unpredictability associated with farming, and helps farmers commit to the platform's recommendations

2. Seeds Selection

VoF will offer buyer & seller eMarketplace platform to buy and sell seeds in a P2P mode. Here sellers will buy seeds from multiple available options of verified / certified buyers offering best rates. The transaction in P2P mode will be empowered through secured Unique Digital Payment (UDP) over VoF App having inbuilt e-wallets for users.

So, the farmers will be able to buy quality seeds with multiple options at best cost offered. Seeds are the foundation for the farming process and first step for quality yield and VoF adds add-on feature with its eMarketplace.

VoF will try to address field requirements by:

(i) Data of soil analysis and testing performed by VoF on fields of farming community.

(ii) Availability of seeds and sustainable resources in the area.

(iii) Weather patterns in the respective farming area along with traditional best practices.

(iv) Local and global food market forecasts based on agronomical and ecological data research.

3. Tools Swapping

VoF will help farmers fraternity to exchange required tools for complete farming process. Farmers can just rent out / exchange their farming tools using Tools Swapping feature available over VoF App. It will range from renting small tools to large tractors or any heavy machinery. Lender need to just upload the equipment name, details, availability, images and location. Needful borrower will just go to VoF App and choose the option. The exchange charge could be settled through UDP on VoF.

It will be settled only after task completion confirmation is provided by both lender and borrower farmers. Borrower farmer can also have option to give rating of the equipment provided by lender farmer. For the movable products like automobile equipment, VoF will integrate GPS facility with the equipment and charge users on the basis of usage according to number of hours used and distance covered in usage.

4. Mandi Rate

Here VoF offers a smart view to co-operatives / farmers through VoF App to view and predict the expected rates of their yield in mandi or market.

VoF will derive the predicted prices of crop yield after the data analytics of previous rates, current national market demands, international demand, weather condition and many more co-related data collected from government agencies and relative APIs. VoF will offer an additional cushion to farmers by integrating technology for data analytics and prediction.

5. Government Subsidy and Schemes

VoF aims is to provide more penetration of government schemes at grass root level to farming community. VoF will enable farmers to gain maximum visibility of the schemes and programs from state / central government.

VoF will support the initiatives of government and make it more assessible to farming fraternity through its one App which will integrate the APIs of these government campaigns.

At the pilot level VoF will use 'Kissan Suvidha App – mKissan' API initially for offering and schemes from government.

6. Call Toll Free to KCC:

VoF will integrate the Government of India initiative of 'Kissan Call Centre' facility to the mobile app for connectivity with Government offers and schemes. From here the users will use app interface to get support and they can call further to KCC helpline Toll Free number for any kind of assistance.

7. Training Infrastructure for Farming Community:

In order to reach illiterate farmers, VoF will train locally appointed affiliate members of the local community to serve as 'Point of Communication', 'Information Broadcast' and 'Link Builder' for farmers. We call them Krishi-Tadnya.

They provide timely best fit and best practice advice based on the learning imparted from the platform, and serve as point of contact for farmers with other stakeholders of the ecosystem. This not only helps farmers, but creates a new opportunity in rural communities for those who are better educated and tech savvy without the hassle of migrating.

CROP AND SOIL MONITORING

Working in consideration with Government of India **'mKissan' initiative**, VoF will help out farmers in most crucial steps of farming. By VoF App complete guidance will be offered to farmer fraternity from seeding to harvesting. So, there are pre and post-harvest achievables outlined and identified by VoF:

Pre-harvest modules of VoF includes

- Predictive analytics using data and information gathered for planting advice to farmers
- A peer to peer marketplace of high-quality seeds and other sustainable resources from locality
- Timely best practice and best fit advice for optimized precision farming to farmers

Post-harvest modules of VoF includes

- Direct sales to local, regional and retail markets through the VoF App with an early bird offering to local merchants and retailers
- Warehousing and logistics of the post-harvest agricultural produce
- Access to premium markets including organic and healthcare produce

Once these achievable are outlined by VoF, they will be achieved successfully by following step by step guide for crop and soil monitoring. This process is further subdivided on further steps:

(i) **Plant Protection Techniques**

VoF App contain information and will showcase all plant protection technique and methods for the listed crops, every crop cycle. The farmers can further get trained or pick up these methods to implement.

(ii) **Soil Nutrient Status**

VoF App show the status of soil moisture level and presence of other nutrients in the soil. This will help farmers to chalk out solutions further to get nutrients or moisture level for their land.

(iii) **Weather Prediction**

VoF App will fetch data from Government Weather Agencies and share it further by making it more easily interpretable for farmers to predict and understand. It will help the farmers to be prepared at some extent from natural adversaries.

HARVESTING / STORING

Since, decades there has been huge wastage while storing the yield. VoF will offer online solutions which will involve all those necessary steps by which farmers can reduce their crop waste from harvesting to packing.

There will be P2P ecosystem between service providers and service seekers for hassle free harvesting and storage of crops.

(i) Harvesting Tools

At this space, farmers can rent / exchange the harvesting equipment and tools by using VoF app where both lenders and borrowers meet-up on this eMarketplace and exchange services and equipment.

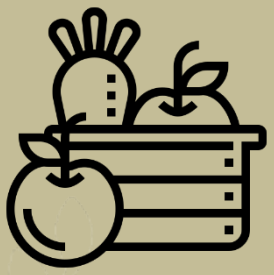
(ii) Warehousing / Cold Storage

The Food Corporation of India (F.C.I.), the **Central Warehousing Corporation (C.W.C.)** and **State Warehousing Corporation** are among the principal agencies engaged in this task. These agencies help in building up buffer stock, which can be used in the hour of need.

The Central Government is also implementing the scheme for establishment of national Grid of Rural Godowns since 1979-80.

Through VoF App, the user farmers may know nearby warehouses location, the cost of storage and available space along with the distance at which nearest storage house is available. These warehouses or cold storages will be listed on VoF app. Thus, VoF will be an eMarketplace for warehouse provider and warehouse seeker.

(iii) Cold-Storage or Warehouse Bookings



Through VoF app, farmers can book their space in advance on listed warehouses available in their vicinity based on their space available for storage. The farmers can also compare among multiple warehouses in their locality for best rates. This will resolve last minute hassles and wastage.

The online solution will act as solution for both warehouse owners unable to rent their unutilized space and the farmers who are unable to move warehouse to warehouse asking for space and negotiating rates.

(iv) Packaging

After successful pilot of phase I of VoF to come up with one App to offer solutions to farming ecosystem, Team VoF will come up with phase II which will implement tamper-proof technique of packaging to ensure that the products are not replaced.

This solution will be launched in future in the second stage of project VoF.

SUPPLY CHAIN

It will involve multiple stages after packaging of the yield to supplying the yield to end customers involving complete supply chain.

(i) Consumer Selling Platform

In accordance with Government of India **Electronic-National Agricultural Marketing scheme** and **AGMARKNET**, VoF will provide a virtual market with a physical market at back-end. All the finished products will be updated on VoF e-selling platform.

The products will come with price tags and all the past information involved (such as geo-tagging, amount of water used, soil nutrients present when the crop was on field, date of plucking, date on which product is shifted in warehouse, if applicable). The buyers will buy from this online platform through UDP.

VoF enables farmers to receive fair prices for their post-harvest produce by selling directly through App to local and international markets, including government mandi integrated with App

Many smallholding farmers depend on intermediaries for the sale of produce, who generally exploit them by buying at significantly suppressed prices and selling at higher margins.

VoF helps solve this problem through the App, where farmers can sell directly to their local buyers and retailers along with additional support for pick-up of produce at best prices. Once their produce complies with export standards, they can also tap into international markets, including organic and premium markets.

(ii) Logistics

By adhering eNAM (National Agriculture Market) protocols of government of India, VoF will follow all quality standards for infrastructure. Here VoF will focus on adding technology for smooth and transparent transfer of products from either warehouse/ retail to add transparency.

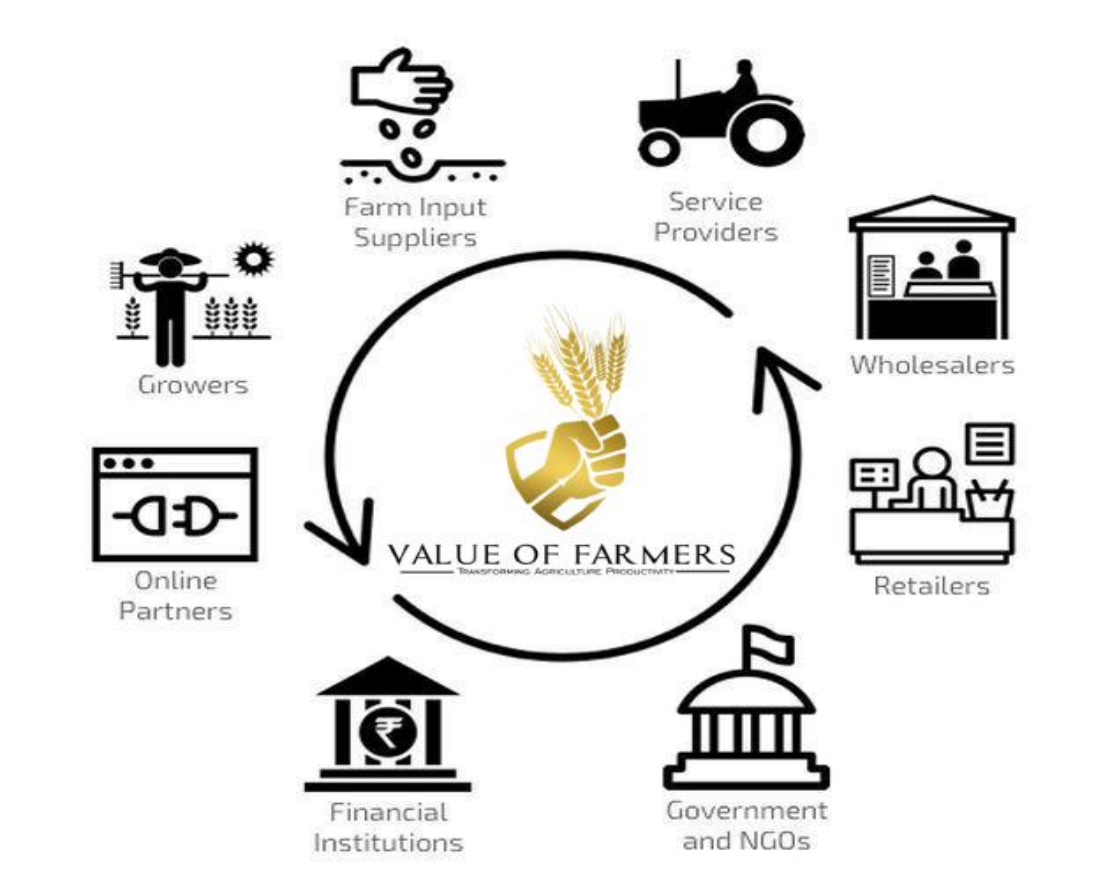
For bulk supply we can use an AIS (Automatic Identification System) enabled vehicle. It will collect the data regarding supply chain such as, real time tracking, temperature monitoring, RFID reader, A/C on/off, moisture control and dust / water proof.

This data will be shared to the end-user / buyer of the finished product. It will give complete transparency of products supply chain.

CHARGE SETTLEMENT

VoF App will also facilitate the charges collected from customers of finished product to co-operatives in UDP. By using blockchain based smart contracts, UDP will be automatically distributed from co-opratives to respective farmers in a transparent and immutable way.

CONCLUSION



VoF will integrate futuristic technologies like Blockchain, Artificial Intelligence and Machine Learning to make solutions more user-friendly, precise and accurate.

VoF will further optimize the farming ecosystem from scratch to screech to increase production efficiency, improve product quality, improve the efficiency of crop chemical use, conserve energy and protect the environment.

DISCLAIMER

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