# BioNet

# The Problem

BioNet

**Air Pollution**

**Agriculture Waste Burning**

**BioFuel**

**Transportation Cost**


**Industrial Impact**

- Biofuel is a renewable energy source, but its **production is quite less** despite the vast agricultural economy which produces lots of Agricultural Waste because of the **defragmentation of land** which makes the field generated bio waste hard to collect resulting in **discontinuous supply.**
- **Transportation cost** of the Agricultural Biomass from its origin to Biofuel production plants constitutes a **significant amount of the total cost** associated with the biofuel production because agricultural waste is very less dense. This makes **biofuel production expensive.**
- **Lack of awareness** about the value of **Agricultural Waste** and the benefits of **Biofuel.**
- **Air pollution** due to Crop Residue burning.

# BioNet

A revolutionary platform for the benefits of our farmers and to increase the overall production of Biopellets with better supply chain management.

- An application which will provide a single platform to the farmers and biofuel plant operators to sell agricultural waste (biomass) and to buy bio pellets. UI is available in local languages for the ease of the farmers.
- Collection vehicles with an attached compressor to compress agricultural waste on-site into bio pellets to increase biomass density & reduce its transportation cost.
- The in-app bidding process for biopellets buyers to ensure maximum revenue generation. Therefore, the maximum profit for the farmers.
- Could be used for selling local agricultural products directly to the customers in the near future.

# Benefits of BioNet

BioNet

- It will have a major impact on our Environment as it will stop the agricultural residue burning in the fields and helps control air pollution.
- It will contribute to the idea of Green Future where we are not dependent on our non-renewable sources of energy by increasing Biofuel production by ensuring continuous supply of bio pellets.
- The application will have a Social and Economical impact on life of farmers as they will be earning more by selling their agricultural waste and at the same time getting awareness about the dangers to our environment and the ways to save it through the application.
- Biomass buyers will have a Better and Consistent price and supply as there is no middle men involved in the whole process.
- Buyers can choose from Variety of agricultural waste best suited for their biofuel production plant.
- GPS feature enabled with path optimization enables to pick up agricultural waste efficiently and directly from the field.

# Business Case : SOLUTION

## BACKGROUND

- Traditional biomass in the form of rice straw, sawdust, rice husk, palm fibre etc. often has a large size that leads to a high storage and transportation cost.
- Traditional use of biomass as an energy source doesn't lead to its proper combustion. For its efficient use as fuel and to ease its transportation for a larger distance, biomass is transformed into pellets which are of regular shape and a form of compressed solid fuel.
- They are easier to use, convenient to transport and store, and have higher calorific value (heat value).
- Although the low calorific value of paddy straw compared to other crop-residue is a challenge, it has good potential for being used as fuel in cooking stoves and heating applications in domestic as well as industry.

## TECHNOLOGY

- Pellet is compressed biomass in 6:1 ratio. Compression is done through mechanical machines.
- The loose biomass is converted to compressed pellets which are 20-40 mm long tablets with 6-8 mm diameter. The shape and size can be altered.
- The combustion of pellets is in specially designed stoves in presence of right amount of oxygen at high temperature produces low emissions.

# Business Case : SOLUTION

## APPLICATION

- Pellets find application as fuel in cooking stoves and heating applications in domestic sector as well as industries.
- It could be a good substitute for coal or direct wood when used in properly designed cook- stove for the purpose.
- It has a huge potential to be used in mass cooking operations like schools providing mid- day meals, mega kitchens, Gurudwaras etc. Cost of such stove is Rs 45,000-50,000.

## PROCESS

The processing involves three major steps.

a. While drying ,the moisture content is reduced to10-15%.

b. It is then crushed and fed into the pellet machine which converts the biomass in compact pelletised form.

c. The pellets can be packed as per end-user requirement.

- One key advantage of pelleting unit is that it balances man-power availability as there is man-power shortage during harvesting season.
- Pelletisation is generally undertaken after the harvesting season and avoided in monsoon season. Feed can be any biomass, for example, paddy straw, forest waste, garden waste, saw mill waste, bagasse.

# Business Case : SOLUTION

## SCALABILITY

- Pelletisation can be easily scaled up as it is not labour intensive and requires very few skills to
- operate.
- The machine does not need any installation and production can be scaled up with few orders.

## SUPPORT REQUIRED

a. Currently many industries are burning forest wood near Aurangabad. (A ten year old tree provides 1-2 tonne wood). This practice can be banned and use of pellets can be mandated for these industries.
b. There are capital subsidies available under Khadi Gram Udyog Yojana from government. Currently, the process is very complex and it is very difficult for the farmers to avail the same.
c. Capital equipment and installation of the same should be made tax free. involves three major steps.
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# Business Case : SOLUTION

## BARRIERS

- Key barrier is availability of dry biomass. In northern India, dew during winters will be a major issue. Dryingunit will cost extra.
- Optimization of transportation (especially using trucks which are on empty return trip etc.) is very crucial for success of business model.
- Availability of raw material is crucial for business model

## ENABLERS

a. Enable service ecosystem to cater to maintenance requirements of pelletisation machines
b. Subsidy on cook stoves targeting specific users for replacing wood or coal usage.

# Business Case : SOLUTION

(for machine capacity of 100 kg / hour)

- **A machine of 100 kg/hr capacity installed will process 1.3 T (1,300 kg) of biomass everyday to produce 1 T of pellets daily, assuming the unit will operate for approx. 10 hours per day.**

- **Capital cost i.e. cost of procuring equipment and setting up the unit is INR 7,00,000.**

- **Annual operating cost would be approx. INR13,26,000** –

this includes raw material cost,transportation cost of raw material and finished product, energy cost, labour cost and rental cost for land required for storage and unit installation.

# Business Case : SOLUTION

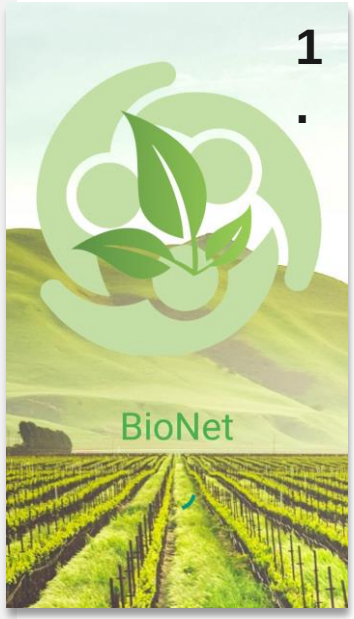
(for machine capacity of 100 kg / hour)

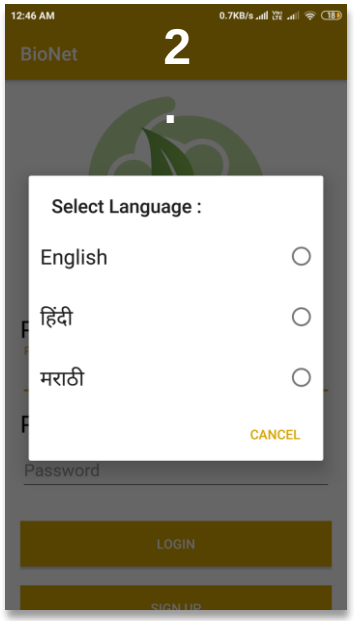
- **Assuming that pellets are sold at INR 9/kg, annual expected revenue would be approx. INR 22,05,000 .**
- **Hence the profit per year would be calculated as (Revenue – Operating cost), which would be equal to INR 8,80,000.**

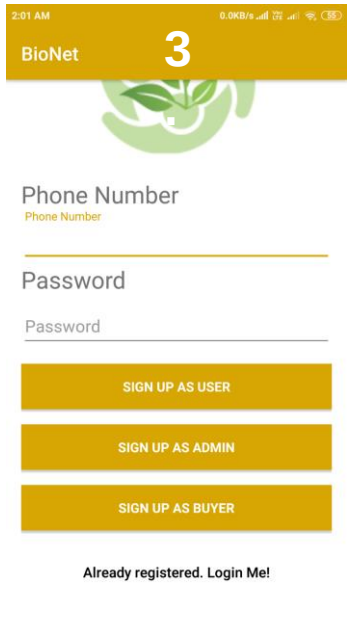
- **Basis projected cash flows, NPV post 5 years i.e. 2022 would be INR 28,10,000.**
- **The amount of time required to recover the initial investment (payback period) would be approx. 11 months.**

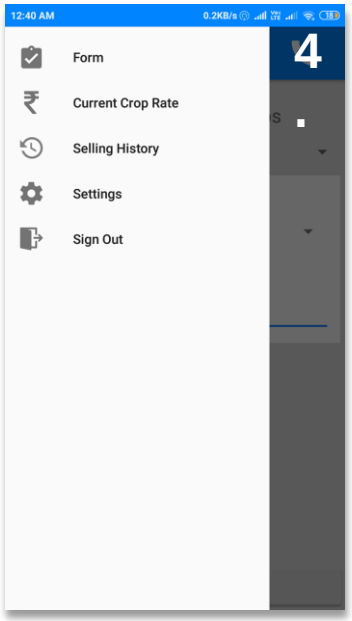
- **This is the working calculation for 1 unit, which can consume upto 320 tons of paddy straw per year. This finally can be scaled across PAN India**

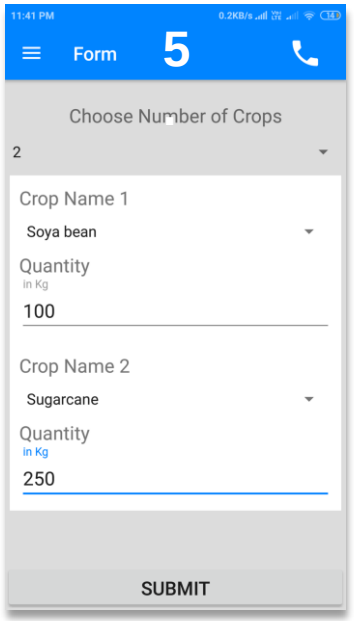
# User Interface

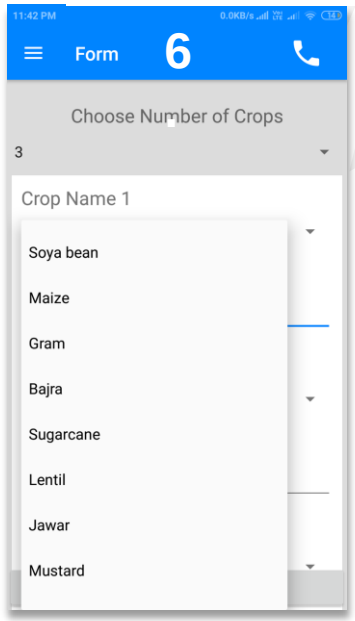


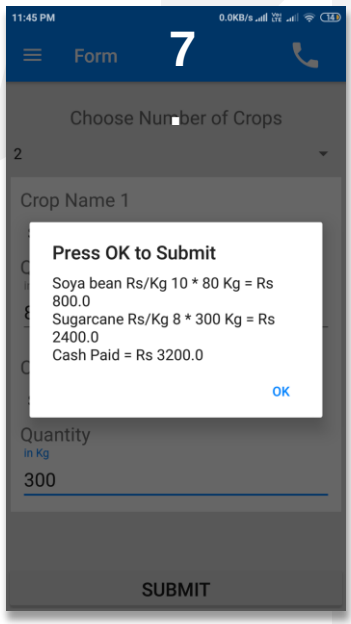



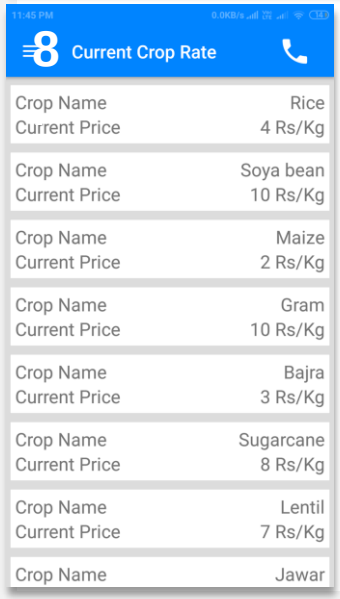



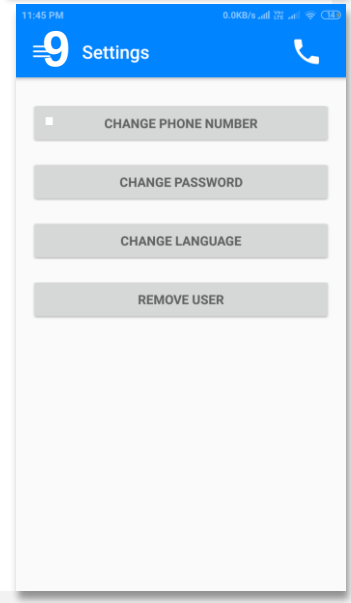



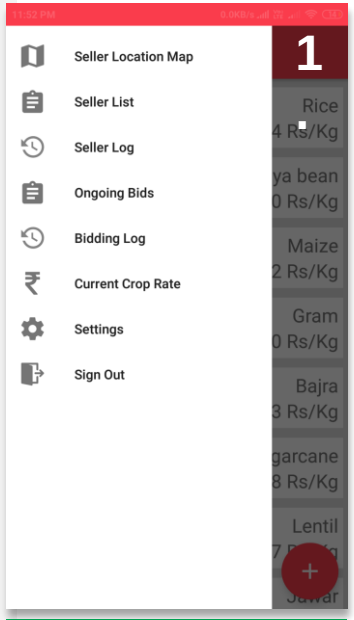



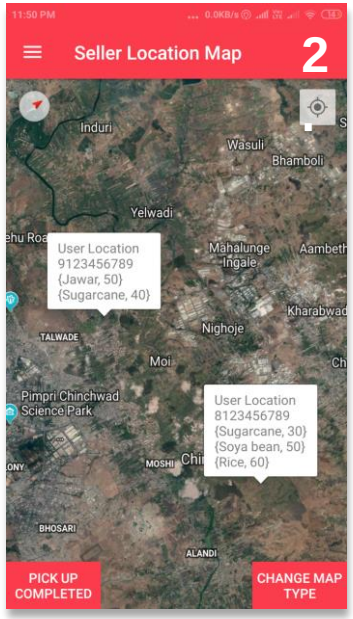



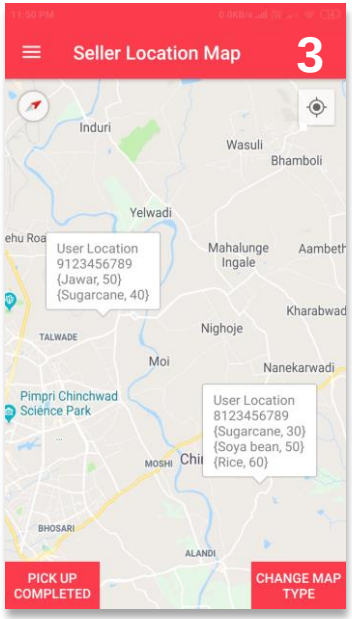

1. Welcome screen.
2. Language selection at first opening of the app. Later it can be changed from the “Settings” menu.
3. Farmers would sign up as User, Biomass buyers would sign up as Buyer & Administrators as Admin.
4. Overview of the User Panel.
5. Form to fill the type of crops and their residues' approximate weight.
6. Crops can be selected from this drop-down list.
7. Split up of the amount that the farmer would get after the pick-up is completed.
8. Current rates of residue which farmer would get on selling agricultural waste. These would be updated according to the market price of the particular crop waste from Admin Panel.
9. Phone number, password or language can be changed from the Settings menu.
10. Phone symbol at the top right corner can be used for help.

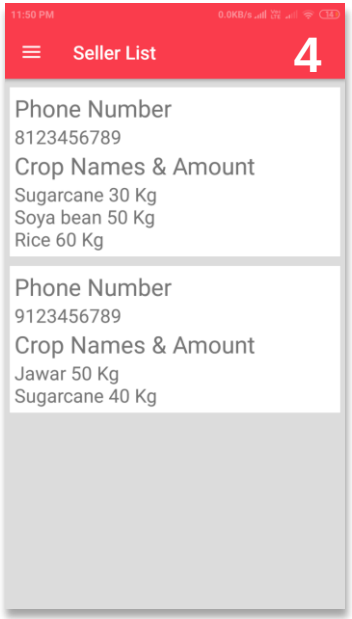


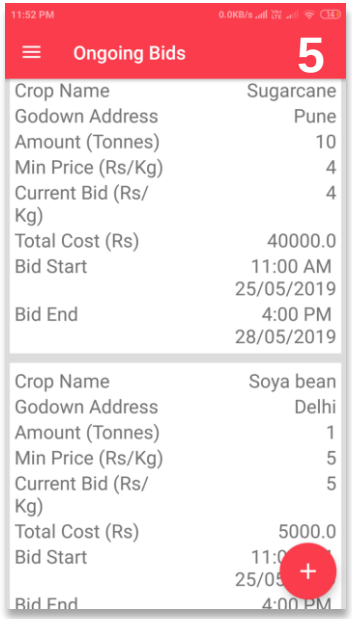
# User Interface

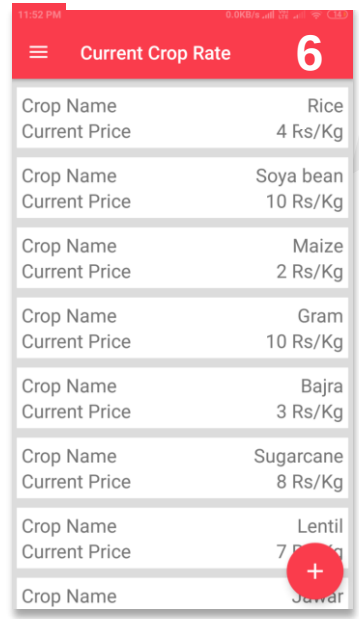


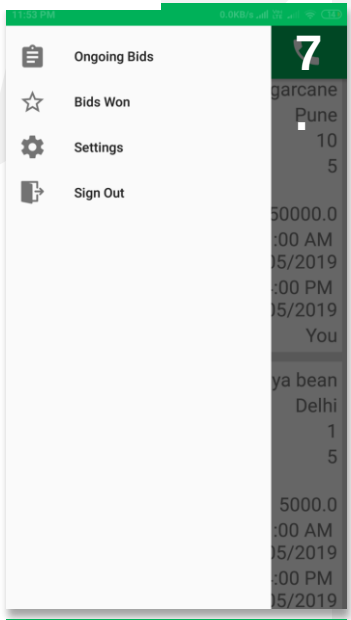



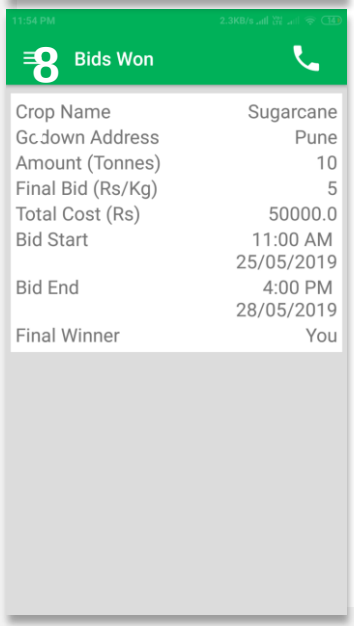



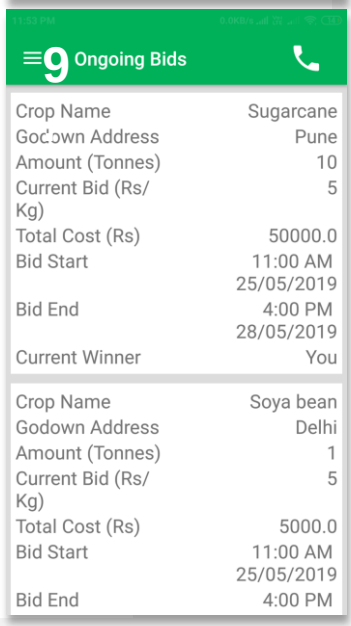




1. Overview of the Admin Panel.
2. Satellite view of the map showing the exact geographical location of farmers' field for pick-up.
3. Road view of the map showing farmers' locations and the amount of the available biomass. An optimized path for pick-up would be shown by selecting all the nearby farmers on the map.
4. Farmers' and their respective crop waste details.
5. Ongoing Bids which shows the quantity, location, and price of bio pellets available. “Current Bid” changes as any buyer bids higher.
6. Current crop waste rate for farmers can be changed from here. Also, new crops can be added.
7. Overview of the Buyer Panel.
8. Showing bids which the buyer is currently winning.
9. Showing all the open bids.

THANK YOU


Thank You
BioNet