

SOFTWARE ENGINEERING

Farmer Subsidy System

Problem Definition And Description

GROUP 3.8

TEAM DETAILS

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1 Problem Definition

Our aim is to design a subsidy system that could provide economic support to the farmers. We are trying to digitise the subsidy system by eliminating the loss occurring due to third person. By digitising the system we can help our clients (government) reduce any loss that may occur due to involvement of third person and also our users (farmers) will be benefitted as the money is directly transferred into their account and on time. The system designed by us provides financial aid to the users based on the farmer category, land area and soil details. Subsidies are given for seeds, fertilisers, irrigation, power facilities and on machinery. The system apart from providing subsidies to the farmer will also display the details of all the subsidies available, be able to track the subsidy status and get notifications for any new subsidies introduced by the government. In this way apart from just channelizing the subsidies effectively to the farmers we are also updating the farmers about any new schemes introduced.

2 Introduction

The “Farm Problem” in which we have inelastic demand faced with an inelastic supply necessitates the need for subsidizing to make sure production stays high, and prices stay low. In India, since many years, government provides subsidies to agriculture sector in direct and indirect form. For encouraging agriculture production and attaining self-sufficiency, the government provides various incentives together with price supporting schemes. Among the agriculture production incentives, subsidies are considered to be the most dominant device to quicken the growth of agricultural production. Most of the subsidies provided are designed to recompense the high cost of production and to stimulate the use of modern inputs. This has surely helped a lot of farmers. But, still there are many who are unaware of the subsidies they are eligible to get.

There has also been a considerable amount of misuse of the subsidies. Since, the costs are mostly borne by the government, farmers tend to misuse the inputs which they had got at subsidized costs. This indeed results in comparatively less crop yields because the subsidies haven't been used judiciously. When it comes to the government's side, the input costs which doesn't represent adequate market costs is definitely a loss.

To resolve this issue, we are aiming to provide a farmer subsidy system which will definitely be beneficial for farmers as well as the government. For our software, the government will serve as our client and the farmers will be our users.

3 Key Concerns in the present farmer subsidy system

The key concerns regarding the subsidizing process still plaguing the system are as follows:

Awareness about the subsidies : Many farmers in India are unaware of the subsidies they can avail that have been provided to them by the government. If there is a way through which they can get to know about all those subsidies available and also be updated regularly about the new schemes introduced by the government in this sector, it will be beneficial in increasing the agricultural production.

Subsidies do not reach the marginalized farmers : The marginalized farmers, the main target audience for the government to come up with subsidies in the first place are found wanting of the same. Effectively, the more well off farmers end up taking more than their fair share.

Withdrawal : Some subsidies should be given and some others can be withdrawn without harming the farmers. Withdrawal of subsidies should be carried out in phased manner. Subsidies which have direct relationship on productivity and income like seeds, fertilizers should be given to farmers, on the other hand, subsidies on electricity can be withdrawn. Farmers prefer regular supply of power even if they have to pay for it. If implemented, it will reduce state electricity board's burden and this amount can be used for production of more electricity, reducing the need of purchasing electricity at very high prices, which adds to the deficit of state finance.

The fiscal burden on the government : The government fails to recover its costs because of taxation issues and is thus led to borrow from other sources. Ineffective taxation policies end up taking their toll on the government's developmental plans.

4 A Solution Strategy

A proposed solution strategy to be effective would need to work on a few basic levels. Them being,

- **Customer Base Identification and Selective Targeting :** Segmenting farmers into three broad categories- small, medium and large based on their economic status, gross cropped area, to ensure that the subsidies reach the ones most in need.
- **Effective channelization of subsidies :** To ensure that the farmers in need properly receive the subsidies they are eligible for without the interference of any middlemen.
- **Database for the farmer :** Every farmer logged in the system will have its details stored in the database. The details such as the personal details for the farmer, the category of farmer, the land related details like the gross cropped area, soil type , the

location , the crops grown on the land are all stored in the database. These details when retrieved will help in providing the suggestions to the farmer for the subsidized inputs available.

- **Logistics Support :** From a logistical standpoint the system needs to develop into a more transparent setup. This can be ensured by integrating the UID (Aadhar) system into the fold. This integration would ensure that leaks are prevented and a more transparent and effective system of monetary transfer is established. Cashless and quick transfer of funds could thus become possible, helping weed out the need for middlemen in the system as a whole.
- **Updating the farmer about new schemes introduced:** The government from time to time introduces new schemes for the development of agricultural sector. Many of these schemes are subsidy based. So, this system will be notifying the farmers that are registered in this system about such schemes.

5 BENEFITS

5.1 For Users (Farmers)

Benefits for the farmer when they use this “farmer subsidy system” designed by us:

- The farmers can apply for different subsidies when in need. The subsidies that are available are:-
 - Seeds
 - Fertilizers
 - Power for irrigation
 - Specialized power driven agricultural equipments such as power tillers, weeders and tractors
 - Water for irrigation
 - Credit and Insurance
- Even though the farmers can apply for any subsidies, the system will allow them to get the subsidy on services which are sufficient and necessary. A few factors taken into consideration are listed below:-
 - **Seed subsidies :** High yielding seeds can be provided by the government at low prices . When a farmer requests for subsidy to buy seeds for crops, he can select which crop to buy based on the suggestions provided by the system. The suggestions will be provided to him based on land location which takes into

consideration the climate in that area and it also suggests other similar crops that can be grown in order to encourage crop rotation. The details of his land location , land area , previously grown crop have been priorly mentioned by the farmer and has been stored in the database of the farmer's profile. These suggestions will be such that it will yield higher crop productivity and will be greatly beneficial for the farmer.

- **Fertiliser subsidy** : It basically refers to distribution of cheap chemical or non-chemical fertilisers among the farmers. It amounts to the difference between price paid to manufacturer of fertiliser (domestic or foreign) and price received from farmers .When a farmer requests for subsidy on fertilizers , considering the soil type and types of crop that grow on the land, the essential type of fertilizers are provided to the farmers in the appropriate quantity that is required by the farmer so that excessive use of fertilizer can be prevented which could damage the crops and degrade the soil quality.

Also, India presently subsidizes only urea as a fertilizer. From an environmental standpoint it is but evident that urea continues to remain detrimental to the fertility of arable lands and thus it becomes necessary to move on to more feasible forms of agriculture such as Organic Farming.

The proposed model of segmentation would effectively work as thus. The farmers having been differentiated into three economic groups namely HIGH, INTERMEDIATE and LOW would thus be taxed/subsidized according to their need, thus ensuring an effective channelization of precious resources.

- Low – Provided subsidized urea
- Intermediate – Neither subsidized nor taxed
- High – Taxed on urea usage

The idea is to push the HIGH end farmers towards Organic farming, and helping the marginalized ones to reach the same levels of profitability.

- **Power Subsidy** : The electricity subsidies imply that the government charges low rates for the electricity supplied to the farmers. Power subsidy acts as an incentive to farmers to invest in pump sets, bore-wells, etc.

- **Tractor Subsidy :** This subsidy helps in promoting agricultural mechanisation in farms. When a farmer requests for subsidies on power driven agricultural equipment, he is eligible for it only if he submits the necessary documents. Under the tractor subsidy scheme, Government give 25% appropriation to Tractor which is taken a toll restricted to Rs.30,000/ – for purchasing Tractors of up to 35 HP.
Also, there are other machineries available for agricultural purposes that will also be provided by the app in suggestions and the farmer can select any of those available subsidized machineries too.
- **Irrigation Subsidy :** Subsidies to the farmers which the government bears on account of providing proper irrigation facilities . It may be availed under minor irrigation scheme . The farmer would be eligible for this scheme only if he possess 1 hectare of land in his ownership free from all incumbency and have clear title of ownership .Also the farmer should have a water source in the form of pond/well near his plot.
- **Credit and Insurance Subsidy :** To procure the inputs, farmers require money. And, there are many farmers who cannot afford these basic requirements for crop production especially at the beginning of the sowing season. Also, post-harvest loans are also crucial. Earlier farmers used to rely on informal sources of finance. Informal or non-institutional credit was largely unregulated and Interest rates were a tool to extract maximum out of farmer. But, through this system the farmers get subsidized credits as well as loan at subsidized interest rates depending on the category of farmer.

Agricultural insurance schemes available for the farmers are:

- ❖ National Agriculture Insurance Scheme – Launched for providing financial support to the farmers in the event of failure of crops as a result of natural calamities, pests and diseases.
- ❖ Modified National Agriculture Insurance Scheme – It provides for subsidized premiums and 25% upfront/immediate payment of claim. It is compulsory for farmer who has taken loan. Private sector is allowed to operate under the scheme and NIAS stands withdrawn where MNIAS is implemented.
- ❖ Pilot Weather Based Crop Insurance Scheme – It insures farmers from anticipated exigencies of weather such as frost, rainfall, flood and humidity, which may result in damage to crop.

The farmer can select any of the available subsidized insurances but he will get them only after proper verification of the documents and details which have been stored in the database .

Agricultural Equipment Subsidy : The government provides Subsidy to farmers through various schemes on various agricultural equipments and machines for small and marginal farmers which helps in increasing agriculture production and productivity. The government provides these machinery at huge discount waiving upto 70% of the price.

- Our system also alerts the user that is the farmer in our system, about any new subsidy related scheme that has been introduced by the government so that farmer can register for that subsidy based on his requirement .
- The system also displays the current status of the subsidy applied.
- It also allows the client to display possible reasons for rejecting the subsidy thus adding to the transparency of the system.
- The system also allows the farmer to apply for a soil survey.
- To ensure an effective system of monetary transfer the account of the user is integrated with UID(Aadhar) thus quick transfer of funds is possible . Also, the receipt for the transaction made is saved in the account of farmer for future reference.

So, basically the farmer just needs to provide in the beginning his personal details , his land and location.(location helps the system in determining the climatic conditions) All his details are stored in the database with his unique id. And then, he can select any category of subsidy he requires. Based on his details that are stored, he will get to select the available and applicable subsidies for the particular subsidy category that he has chosen. Finally, the farmer also gets updated regarding any new subsidy schemes through messages or notifications.

5.2 For Clients (Government)

Benefits for the government when the farmers use the “farmer subsidy system” designed by us:

- This system ensures that the subsidy is given only after verifying all the documents and if the eligibility criteria are met.
- Also a certain threshold is set on the direct and indirect subsidy a farmer is eligible for , this could easily be saved in the database of our system After verifying with the

information on database the subsidy is assigned to the farmer only if the amount he demands for is less than the threshold.

- The user is automatically alerted about the new schemes introduced thus reducing the advertising costs .
- Also since most of the work is automated it reduces the labor cost without having to establish farmer friendly kendra's everywhere .
- Also by using this system , information about the subsidies can be accessed even in remote locations.