



SELF SHEILDING FARM

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Abstract: As we all know the present worst case scenario of our agriculture land, there are in timely rains and also floods, droughts and famines. There are also some regions in India where there are very heavy rains and also places of hail storms and heavy temperatures. Thus to get better yield of crops and generate revenue so that farmers of India can produce crops yearly and face no issues while farming and earn good income, Self shielding farm is constructed for farm lands to protect the crops from higher temperature and heavy rains. It also protects the crops from external factors of natures. Considering the requirement of crops the self shielding farm is designed accordingly.

Keywords: Self shielding farm, temperature, economy,

I. INTRODUCTION

Self shielding farm is an alternative to safe guard the crops from excessive rainwater and access wind which destroys the crop, thus damaging the yield of farmers in heavy rainfall areas. It is structure which fights against heavy rainfall and winds which destroys the crops. Self shielding farm protects the crops against heavy rainfall. It shields the farm or the area under cultivation with the help of acrylic of fibre glass sheets which automatic shields by detecting heavy rainfall.

A. Types of self shielding farm

- a. Automatic
- b. Manual

Automatic: The system of self shielding farm works automatically with the program set in Arduino as it detects the high water level which closes the shielding and the excess rainwater is transferred through the tanks and pipe which gets collected in the acquifers or wells. The costing will be increased due to automation but it will be reliable to the farmer.

Manual: Chain pulley mechanism or lever mechanism can be used manually. The costing will be less than as no use of advanced technology is been used.

- To protect the crops from external factors such as winds, insects, heat, ets.
- Recharge water into aquifires which helps in improving the quantity of existing groundwater and use of water when there is no rain in farm.

III. DATA COLLECTION

It has been observed that the rain chart in India varies from state to state with the regions of heavy and highest rainfall in the country. Thane, Ratnagiri, Palghar, Pune, Satara, Sangli, Nanded, etc are the districts which receive 86% of

rainfall and Raigad, Sindhudurg, Dhule, Ahmednagar, Kolhapur, Jalna, Latur, etc are the districts that receives 75% of rainfall.

- Crops destroyed by heavy reainfall

Heavy rainfall in India has damaged key summer crops which is rice, soyabean, pulses, cotton and vegetables just before harvesting.



Fig. 1 crops destroyed by heavy rainfall

- Crops destroyed due to Hailstorm

In Maharashtra accompanied with unseasonal rain, hailstorms also occurs which destroys the crops. Hail is one of the most feared weather phenomena because it has potential to destroy plants, trees, crops, animals and human life if impact is strong enough. This can be an adverse effect on ecosystem if the damage is severe. We have added a solution to the problem of hail storms by providing a mesh over the self shielding farm which can protect it from destroying the crops and humans to get shed below it as it is safe.

animals and humans to get shed below it as it is safe. Farmer can provide the hail storm protection mesh to avoid damage.

- Crops destroyed due to high temperature

Marathwada and Vidarbha are some regions that face low rainfall with highest temperatures recorded. Chandrapur in Maharashtra has highest temperature. There are two major forms of extreme temperature stress and crops heat and cold. An increase in global temperatures may have both of these two acute effects- more frequent high temperature stress and less frequent cold temperature stress. Global warming impact will be greater in the northern than Southern hemisphere because there is more high altitude area cultivated in the Northern hemisphere. Increased temperature would also effect the crop calendar in tropical regions.



Fig. 2 crops destroyed due to high temperature

- Crops destroyed due to acid rainfall

Scientist believe that acidic water dissolves the nutrients and helpful minerals in the soil and then wash them away before the trees and other plants can use them to grow. At the same time the acid rain causes the release of toxic substances such as aluminium into the soil. Acid rain comes from chemical reaction in the atmosphere among oxygen, water and sulphur or nitrogen oxides. Acid rain can damage the leaves of vegetables such as spinach and cause blemishes on delicate product such a tomatoes. The production and quality of the root vegetables is reduced.

IV. CONSTRUCTION PROCEDURE

1. Foundation for pillars and excavation: The soil present is black regular soil so foundation should be at suitable depth so that the foundation can withstand wind pressure and soil pressure and water pressure. The foundation can be concrete or steel pillars as per the requirement of farmers. Both foundations vary as per price.
2. Land filling and giving elevation to cultivation land: Land filling with hard strata over which elevated a little bit of high so that water cannot overturn the crops and soils.
3. Connecting the pillars through beams: The pillars at a height of 3 m are connected to overhead beams where the sliding mechanism is fixed.
4. Arrangement of sliding mechanism: The sliding mechanism has to be fixed on the beams horizontally and fixed with bolts and screws.
5. Roofing sheets and machinery installation: The roofing sheets are to be cut from between in their rectangle size as per the overhead tanks.
6. Piping and digging holes in aquifers: The pipeline connected through the overhead tanks join the groundwaters which is collected to aquifers and wells or riverbeds.
- 7.



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Fig. 3 Isometric view of self shielding farm

V. ESTIMATE

Estimate of Self shielding farm of 2 guntha plot:

Name of work	Cost (in rupees)	Area	Unit	Amount
Site clearance	Lumpsu m	202.4	Sq.mt	5000
Construction of columns	8000	9.24	Cu.m	75000
Beams of woods and railings	3000	26.6	Cu.m	79800
Roofing with acrylic	60	202.4	Sq.ft	12144

sheet (12mm)				
Roofing tanks	60	402.8	Sq.ft	24288
Pipeline and supply to ground	150	46.6	Sq.ft	7000
Mechanism installing charge				25000
Total				231232

Table 1. Estimate

VI. CONCLUSION

The importance of self shielding farm lies in the fact that it can store water for future use. Self shielding farm or rainwater harvesting in a proper way can be permanent solution to problem faced by the farmers. Self shielding farm is going to give the benefit to the farmer if they install it once.

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