



Estd. in 2001



TITLE : SMALL-SCALE PADDY TRANSPLANTER

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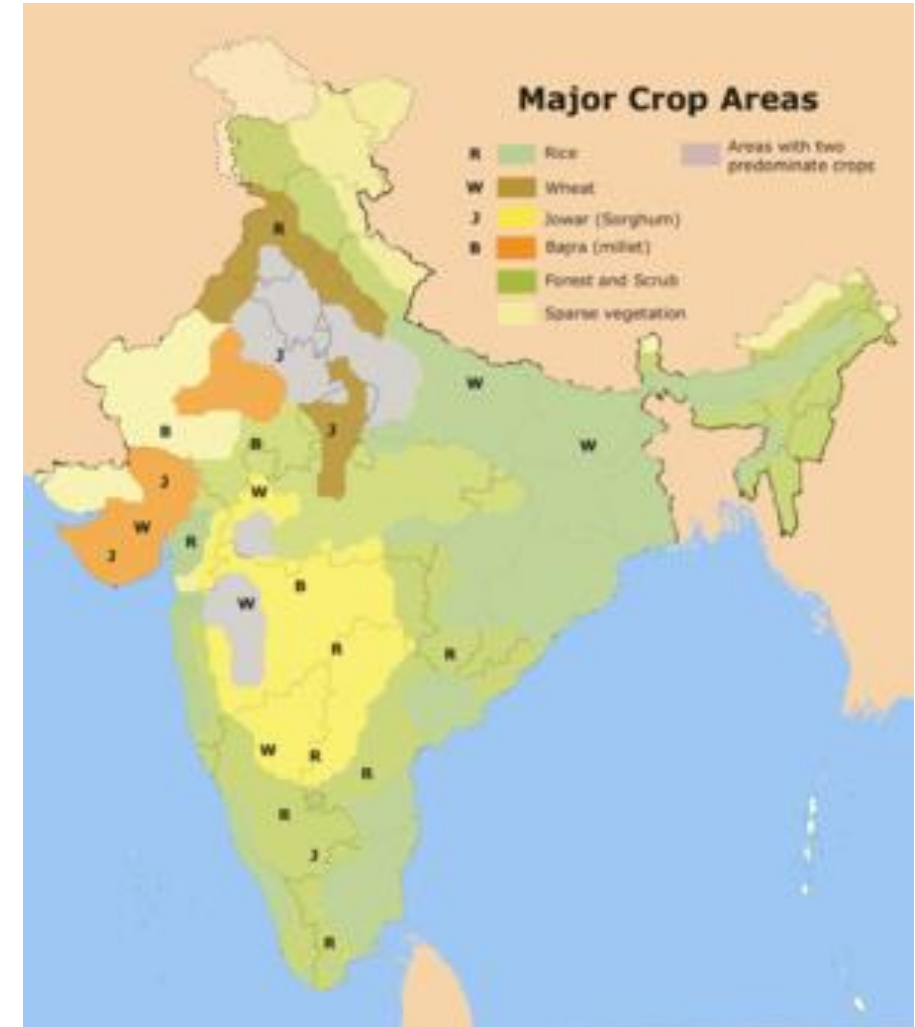


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Introduction



1. Manual seed planting process, resulting in low seed placement, spacing efficiencies and extreme back ache for the farmer, reducing the field size that can be planted.
2. The cost price of the imported planters has gone beyond much of our farmers' buying power.



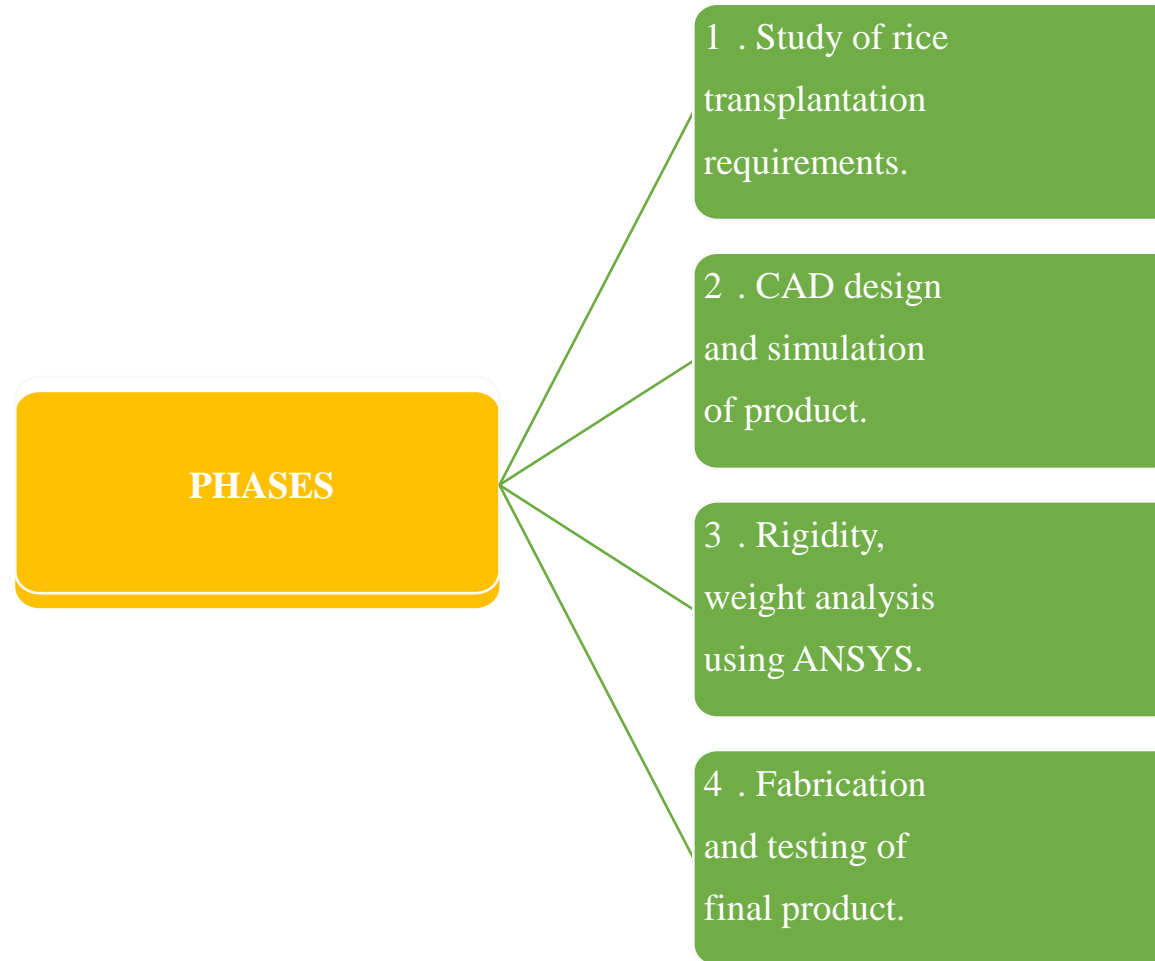
Introduction



3. Peasant farmers can do much to increase the production of food, particularly grains, if drudgery can be reduced or fully eliminated from its planting operations.
4. To achieve the best performance from a seed planting machine, the above limitations must be minimized by proper design and selection of the components needed on the machine to meet crop needs.

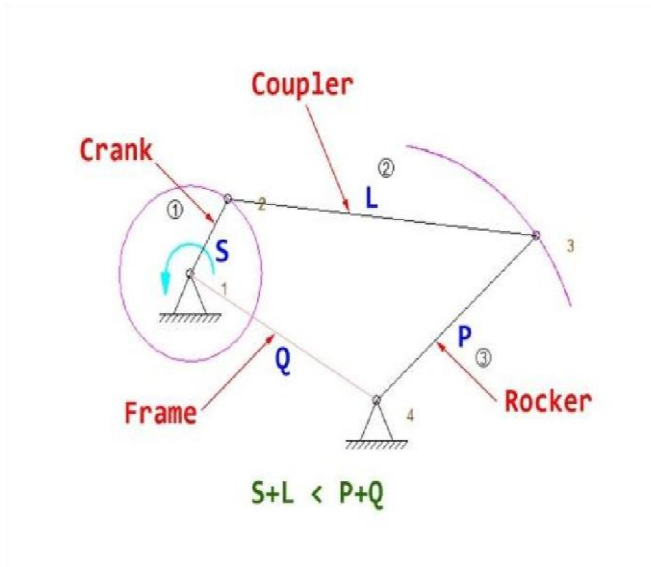


Proposed Architecture

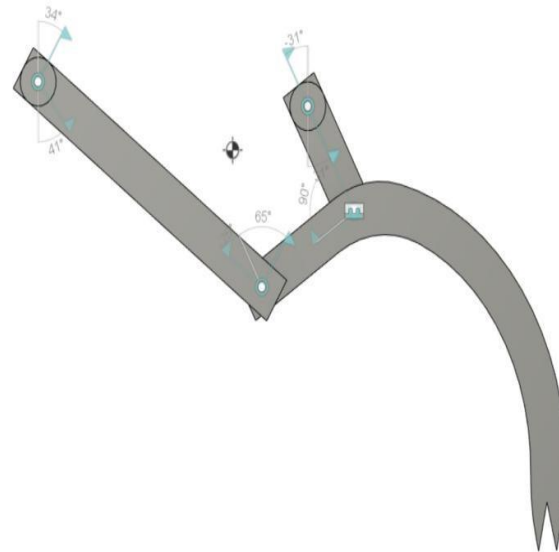


Phases of the project

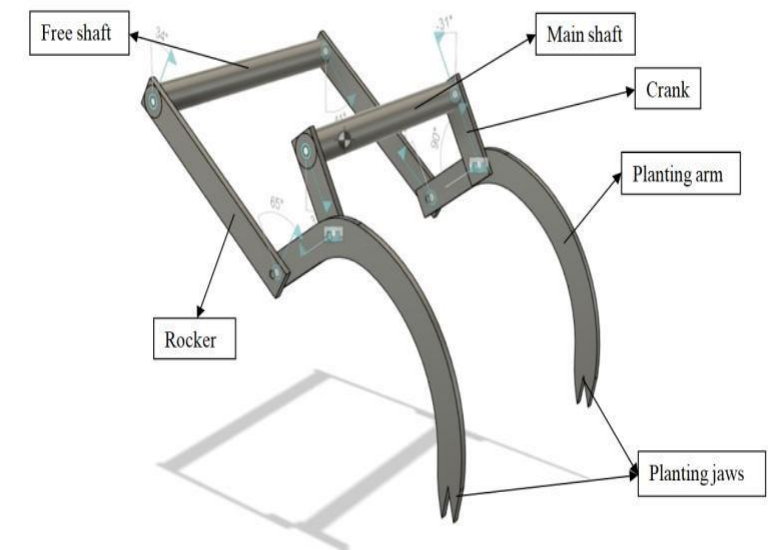
Implementation / Testing



Crank-rocker mechanism

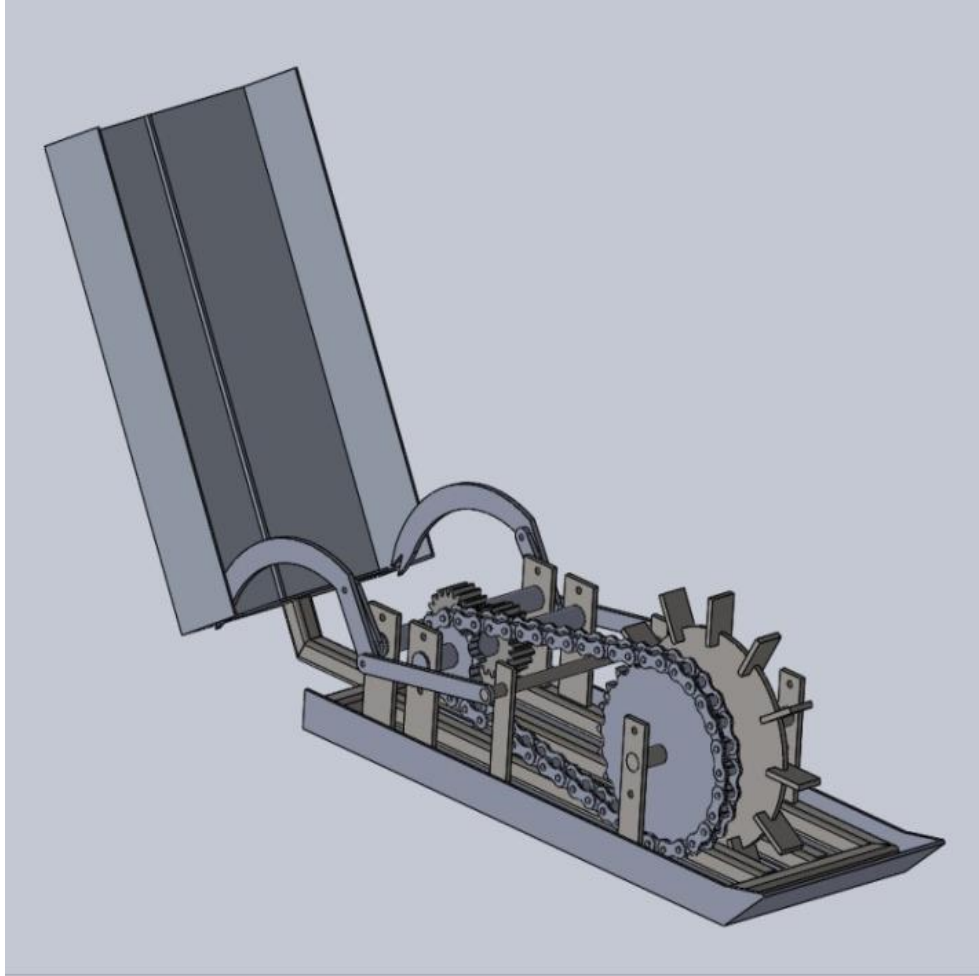


Side view of planting mechanism assembly

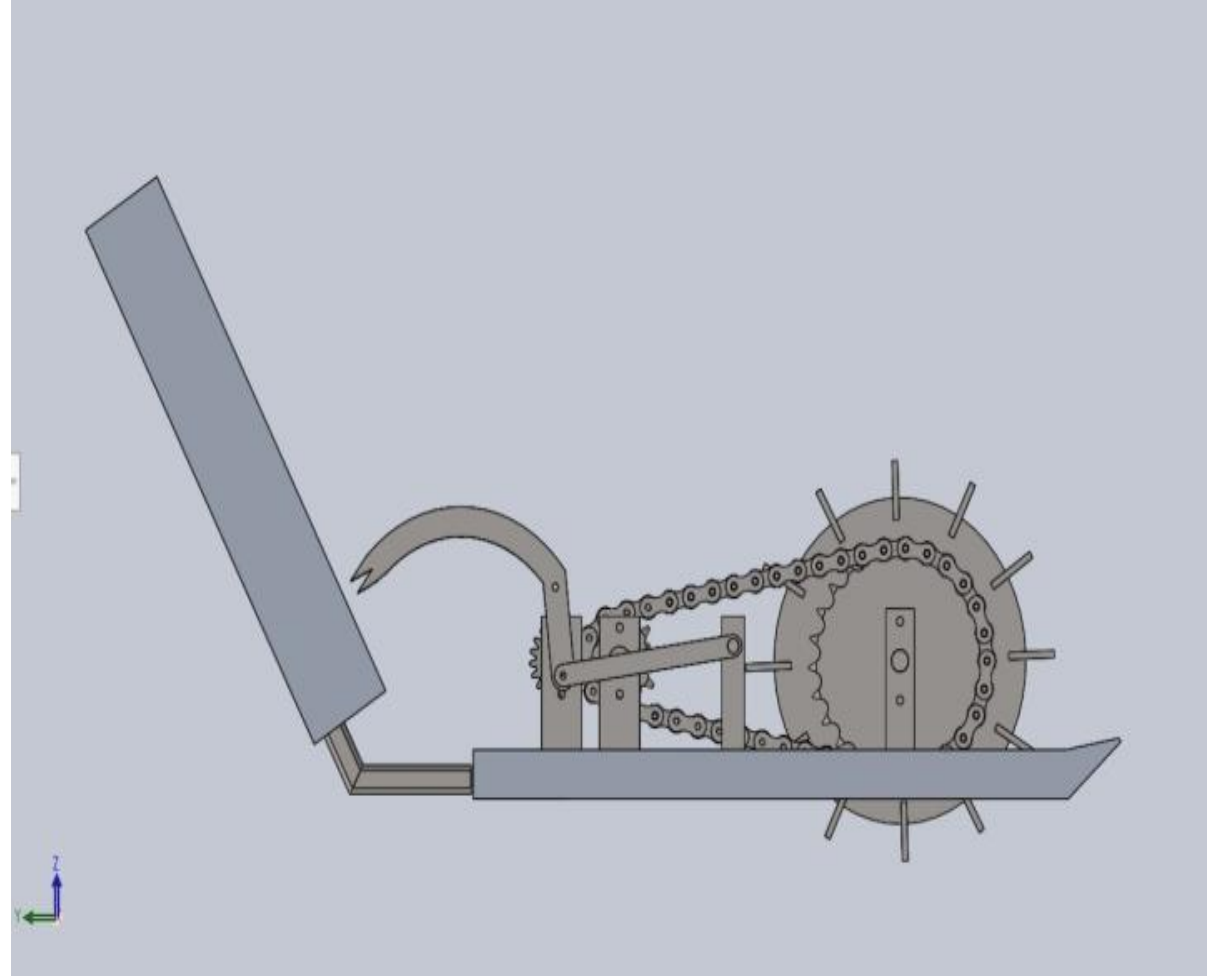


Sapling planting mechanism

Implementation / Testing

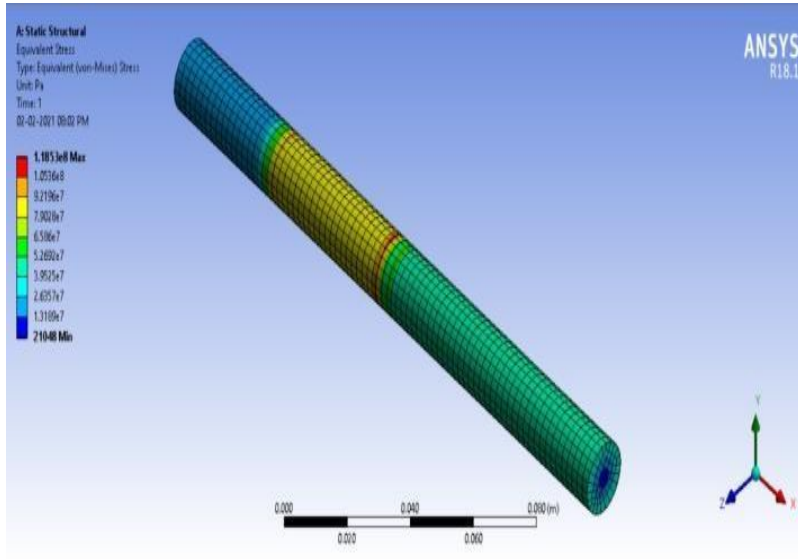


CAD model

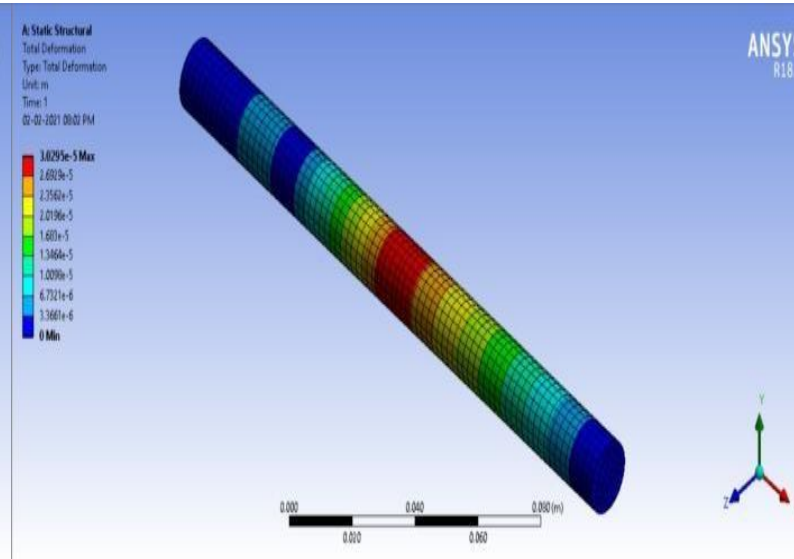


Side view of model

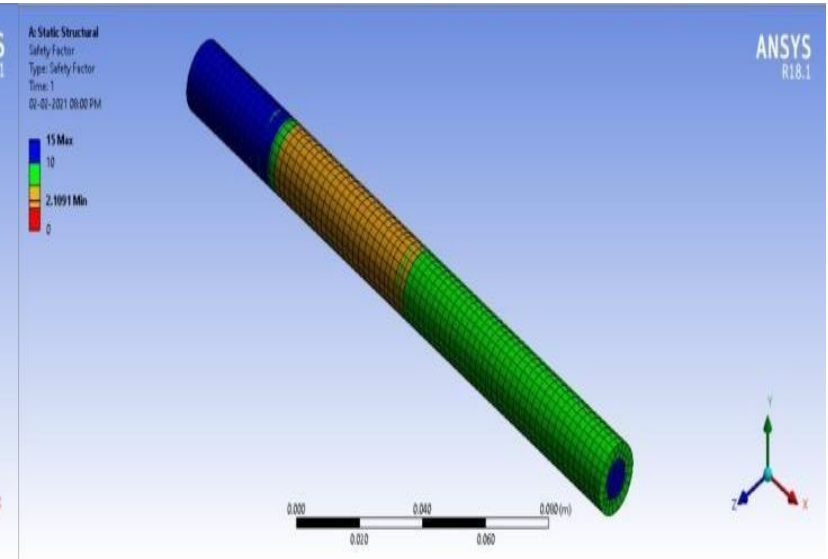
Implementation / Testing



Equivalent stress on input shaft



Total deformation of input shaft



Safety factor of input shaft

Equivalent stress = 118.53 MPa (max)

Total deformation = 3.0295×10^{-5} mm (max)

Results and Discussion



- The cad model is safe from failure.
- All the tests using manual transplantation machines were conducted in small fields ranging from 150-400m² area.
- It was found out that the time lost in turning the machine to start planting in a new row was very less.
- The efforts required were drastically reduced as observed through experimentation and testing.
- The same can be expected from this design after fabrication.

Conclusion



- Mechanical transplantation definitely achieves a better result in comparison to conventional hand transplantation.
- Further reducing the weight requires material change but if successful can in turn minimize the effort required which in turn can increase productivity.
- Using a motor the machine can be automated to achieve maximum efficiency.

