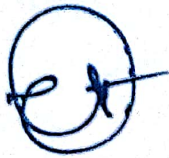


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**CERTIFICATE**

This is certify that, the Project entitled “**DESIGN AND DEVELOPMENT OF AGRIWASTE BRIQUETTE MAKING MACHINE**” is a bonafide work done under my guidance and is submitted by **Arpita A. Gulhane** to **Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur** for the partial fulfillment of requirement for the award of Post – Graduation degree, **Master of Technology (M. Tech.) in Mechanical Engineering Design (MED)**.



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## ABSTRACT

In India every year millions of tons of agricultural wastes are generated. Agricultural wastes are waste from farming, forestry, horticulture and other farm operations. There is a rapid increase in the volume and types of agricultural wastes due to intensive agriculture in the wake of population growth and improved living standards, which are now becoming a major problem as rotten waste biomass emits methane and leach-ate. Open burning of these wastes by farmers usually generates carbon dioxide (CO<sub>2</sub>) and other local pollutants. Most agricultural solid wastes are generated by the rearing of animals, and harvesting and processing of crops.

The aim is to design and develop the agriwaste briquette making machine in consideration with properties of agriwaste and problems in availability of cheap energy sources. In present huge quantities of agro-residues are produced after the harvest by many of the developing countries but they are used inefficiently causing extensive pollution to the Environment. The major residues are rice – husk, coffee husk, coir pith, jute sticks, Bagasse, groundnut shells, mustard stalks and cotton stalks. Saw dust, a milling residue is also available in huge quantity in India. Problems associated with the utilization of these residues are for transportation, storage and handling. The direct burning of loose agro-residues in conventional grates is associated with very low thermal efficiency and widespread air pollution. The machine is developed based on various design parameters responsible for its performance and study with the help of actual performance and modifications are done.

The design calculation of agriwaste briquette making machine is done. For designing the agriwaste briquette making machine, it is calculate required design parameters such as pressure of punch, depth of die and punch, design of chain drive and rack and pinion and design of ratchet and pawl. After designing, it is fabricated the agriwaste briquette making machine. Tests were conducted and require changes were made. The total estimation of fabricated machine is given. Also it shows the cost of each part of machine and number of parts used in the machine. The results are presented. The design and fabrication is shown. Also the future scope of agriwaste briquette making machine is identified.





**Fig. 5.2 – Back and Front View of Actual Arrangement of Machine**



**Fig. 5.3 – Side View of Actual Arrangement of Machine**



## 7.0 CONCLUSION AND FUTURE SCOPE

### 7.1 CONCLUSION

From the above study, it is observed that by arranging different mechanical components along with different mechanisms, machine can be made efficient to making agriwaste briquette to control the pollution and fulfilling the energy demand. Thus human efforts to use and disposed the agriwaste, using the agriwaste to make the fuel briquette can be an effective energy source and way to earn money.

Based on the working of the machine follows conclusion can be drawn.

- ◆ Agriwaste of any type can be used in this machine.
- ◆ The agriwaste dust should be of maximum 15 to 20 mm length for proper binding.
- ◆ The different binders can be used for making agriwaste briquette.
- ◆ Some of the agriwaste generates glue when compressed, such material can be used to produce briquette without binding material.
- ◆ Farmer burn the leftover crop after the harvest. This can help them in generating fuel source and save money.
- ◆ Small sizes of briquette are easy to manage and store than the original crops.
- ◆ Even the unwanted grass in social area can be used to make briquettes. This will help in keeping "Clean India Mission".
- ◆ The machine can generate self-employment for rural youth and poor.
- ◆ Payback period is just two months.

### 7.2 FUTURE SCOPE

This project has various futuristic technologies and uses also which are still under R&D because there are so many areas which are to be taken into consideration to make this machine more durable and more efficient. Agriwaste is a most available in India which can be used in the various industries where required the heat as an energy source in the form of briquette. Also this machine is helpful to start the small scale industries in the villages especially for Self Help Groups of village women (Mahila Bachat Gat).