

A Study of Agricultural Mechanisms for Slurry Sieve Production and Design

Rahul Mane¹, Govind Yadav²

Student¹, Professor²

Department of Mechanical Engineering

Guru Premsukh Memorial College of Engineering

Corresponding Author's E-mail: imrahul89@gmail.com¹

Abstract

Agriculture is India's economic backbone, providing all of the country's food to roughly 75% of the people. Many methods for growing sophisticated farming have been created in India, however they are beyond of reach for most farmers. As a result of the high cost of protection and purchase. For this reason, it's imperative that we find a means to boost output while still meeting the needs of the suppliers, and this project has come up with a method for doing so while simultaneously reducing the rising malnutrition graph. As a result, we want to create a device known as a "biochemically sieved slurry." This may be afforded by both big and small farms. The gadget is purely agricultural in nature.

Keywords: *Biogas, Agricultural Mechanism, Indian Economy, Slurry*

INTRODUCTION

A by-product of anaerobic processing, biogas slurry provides biogas (burnable methane gas) for cooking, lighting, and operating motors. Biogas slurry is produced from a biogas plant. Slurry may be used as-is to prepare crops, or it can be combined with other natural and synthetic manures to improve crop performance.

Slurry is a refined source of animal waste, and adding urine (creatures' excrement) increases the nitrogen content, speeding up the fertilizer-making process.

Phosphorus, potassium, zinc, iron, manganese, and copper are also found in the processed biogas slurry, many of which have been removed from the soil as

a result of poor agricultural practises. It is also possible to use slurry to create nutrient-rich soil for crop production.

Slurry has a greater concentration of minerals and supplements than composted soil since it has been processed. Slurry application has effects that are almost similar to those of using synthetic composts. Processed slurry is now a viable alternative to synthetic manures. When used as manure, Biogas Slurry is considered a good source of full-scale nutrients like nitrogen and phosphorus as well as micronutrients like zinc and manganese that are critical for plant growth. The use of biogas slurry gives agriculture, condition, and cultivation networks a viable approach.

Using slurry on pomegranate trees helps the plants develop quickly and provides food nutrition because slurry improves soil texture and reduces production costs. It also boosts soil bacteria, which results in healthier plants and a more robust tree. Slurry is beneficial to soil and crops, as well as plants, even before the plants have reached their full two-year age. Slurry nutrients are inexpensive and readily accessible in huge quantities. Slurry increases the development of microorganisms and the creation of

earthworms, so crops receive micronutrients, carbohydrates, and proteins. This isn't a synthetic fertiliser, so farmers don't have to bother making slurry. Instead, by putting in a little additional work and feeding plants with slurry, farmers may increase their revenue while spending less money.

Because animal urine has a wealth of nutrients, the slurry technique may be used. In the absence of gobar gas facilities, the material from the slurry will be made from animals' fresh dung that has been kept out of direct sunlight. Cement or plastic tanks are required for slurry production. Each acre of land should have a 400-liter tank built by the farmer (i.e.320 plants). It is necessary to calculate the slurry's volume before to producing it. On-time delivery necessitates the use of micronutrients and microbial fertilisers. These fertilisers will be more effective and less expensive if they are delivered in the form of slurry. There are many benefits to using a drip irrigation sprayer to apply slurry to plants. Additionally, by lowering the cost of spraying, fuel/petrol is saved. Additionally, the transportation costs associated with purchasing gasoline are avoided. Because the farmer does not need to hire help, he can spray far more effectively than he ever could with only slurry.



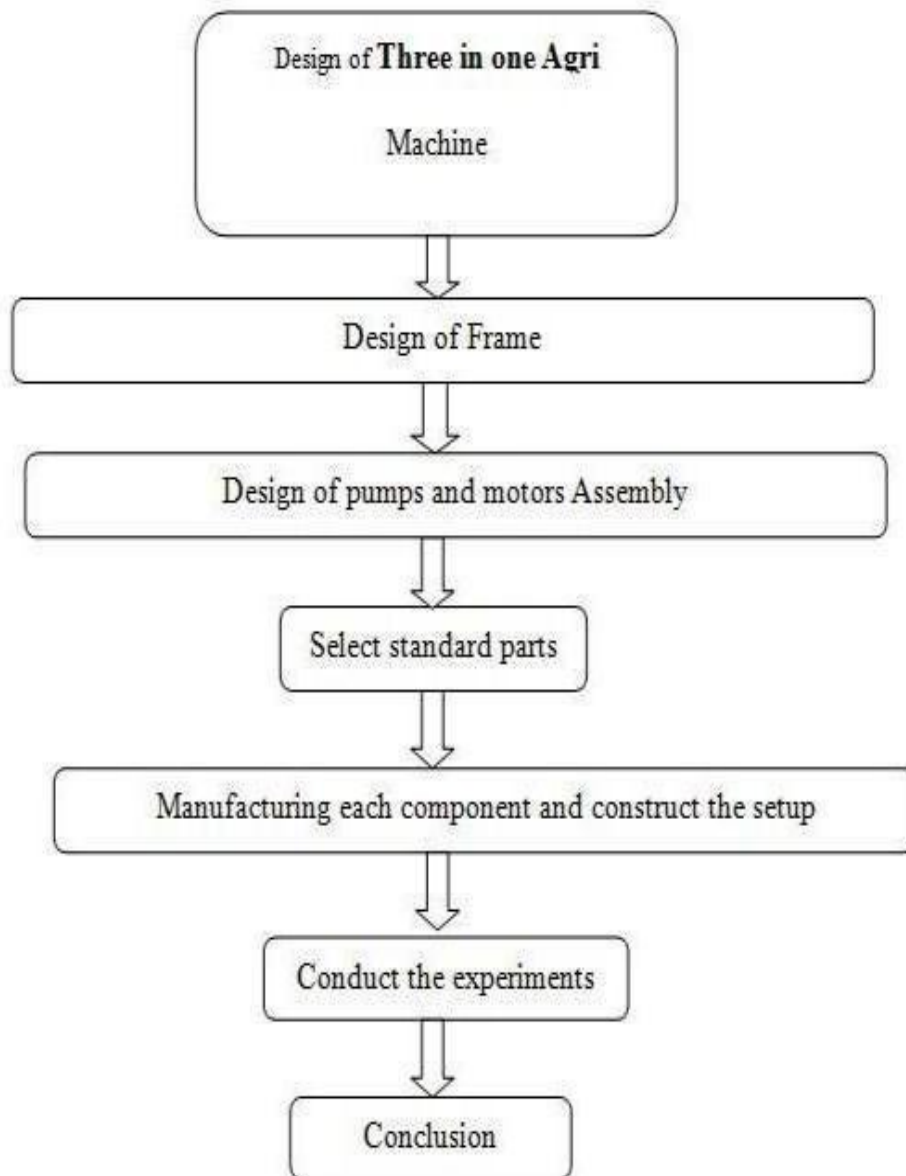
Fig.1

Agriculture Slurry

Slurry is now a need for increased productivity and has played a role in the worldwide revolution in agricultural output. Method of use that is appropriate. Agriculture and the machinery used to apply crops are critical to the industry's success. The primary goal of this slurry application on crops is to keep the slurry under control while requiring the least amount of work and time. RND mechanical project's new setup includes agricultural slurry, which we created. Farmers often employ this kind of slurry.

The slurry may be transported to areas in need of organic fertilisers with ease. Slurry is a very effective fertiliser, which means it may help crops grow faster (Ahmad et al. 2009). In order for plants to flourish, they need a lot of nitrogen. In

comparison to other organic fertilisers like FYM and compost, biogas slurry includes a greater quantity of macro- and micronutrients as well as significant amounts of organic matter. When compared to synthetic fertilisers, the quantity of harmful heavy metals is negligible. Because biogas slurry (organic fertiliser) is non-toxic and non-polluting, it may be used in place of synthetic fertilisers. Artificial fertilisers were used in significant quantities in the nation as early as the 1960s, and when yield-boosting crops began to be developed, the need for synthetic fertilisers skyrocketed. To ensure healthy plant development, such as tomato, cotton, and graphs, these plants must be protected from disease, and the slurry must be applied to the farm field at regular intervals.



CONSTRUCTION DETAILS

A stand is made of light steel, which provides the much-needed strength and lightness when all of the equipment is used together, including the tank, mixer, and filter in the tank. The whole system design is a space-requirement arrangement of different components on the main frame system that works with varied physical limitations. A model's design may be

divided into two components, which are as follows:

1. Design of parts
2. Parts to be purchased

DESIGN OF PARTS AND SPECIFICATIONS

Components of multipurpose agro equipment

- MS stand

- Slurry liquid tank: 100 Liter
- Spraying pipe: 2m.
- Motors Cutter: 50W,
- Switch & Toggle
- Frame: size= 5*5ft (Mild Steel)
- Ground wheel: D=50cm
- Cutter: Circular D=50
- Small net filter

The electrical supply to the mixer is then turned on, and the mixer is placed in the top tank, which contains a combination of cow dung, cow urine, oilseeds, pulses, water, and other important commodities, among other things. With the assistance of an electric mixer and the blade, the mixture is thoroughly mixed.

After mixing the mixture, the top tank's cock is opened, and the slurry is discharged into the lower tank. While the slurry passes through the top tank, it is filtered by an inner net that is placed in a circular pattern in the upper tank and light objects such as sticks are mulched.

The lower tank's net caught the remaining raw material, and the slurry fell into the lower tank. The slurry is then applied to the plants through drip irrigation.

PROBLEM STATEMENT

To research and develop solar power equipment for a variety of agricultural applications. This initiative offers small-scale farmers with three needs solutions: cropping, spraying, and dusting, as well as the usage of a three-in-one agricultural equipment.

JUSTIFICATION OF PROBLEM

Plants such as tomatoes, cotton, grapes, and other fruits and vegetables need protection from various illnesses, as well as the removal of undesirable grass congress from agricultural fields at regular intervals. For this, a lot of work is needed, as well as many agricultural equipment that cost a lot of money. Agriculture equipment such as spraying machines, cutting machines, and dusting machines are used to spray solid, liquid, or mist pesticides, and sieved slurry is utilised for growth or as an in agricultural fields. Slurry is also sprayed to improve the quality of the crop, therefore it should be sprayed evenly over the plant. Spraying machines and drip irrigation are needed to apply insecticides evenly. This machine can only be operated by a single person.

ADVANTAGES

- The machine has very low error.

- The size of project made by is more suitable for material handling system. It has low maintenance.
- The system has worked fully switched operated.
- Size of machine is small therefore it is easy to transport.
- Weight of machine is low.
- Pollution free. Cost effective. Easy in operation.
- Multiple operations can be performed at a time.
- Less maintenance cost. High efficiency.
- No need of skilled operator.

APPLICATIONS

- Use in agriculture purpose.
- Used loons.
- In industries purpose.
- Small scale industry
- Used in colleges plant .

CONCLUSION

This is a cost-effective option for both big and small-scale farmers. Agriculture is the only source of power for the gadget. Because it is ecologically benign, slurry is one of the most preferred resources for plant development.

Biogas slurry application has also shown that for certain crops, this slurry may be used as a high-quality natural manure in sustainable horticulture to maintain the quality of harvests.

Apart from significant quantities of natural problem, this slurry may be able to provide a variety of big and small-scale supplements. Increases in yield owing to field crops, peas, onions, grapes, etc. Due to the continuous use of slurry with greater effect on crop, the use of slurry method for pomegranate plants is beneficial for fast plant growth and nutrition sustenance. Finally, biogas slurry provides a profitable way for agribusiness to reduce certain manure problems faced by ranchers in our country and enhance plant quality and rancher situation. As we wrap up this report, we are pleased to have finished sieve slurry electric mixer quickly mixes the slurry. It can readily sieve slurry. Slurry may be applied to plants through drip irrigation, which lowers the amount of time, effort, and labour required, as well as the slurry issue faced by farmers.

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