



# MOTORISED WEEDER USING CRANK MECHANISM

Dr Harish Harsurkar<sup>1</sup>, Prashant Landge<sup>2</sup>, Rahul Thorat<sup>3</sup>,

<sup>1</sup>HOD Mechanical Engineering Vidya Prasarini Sabha's College of Engineering and Technology, Lonavala

<sup>2</sup>Student Mechanical Engineering Vidya Prasarini Sabha's College of Engineering and Technology,  
Lonavala

<sup>3</sup>Student Mechanical Engineering Vidya Prasarini Sabha's College of Engineering and Technology,  
Lonavala

## ABSTRACT :

Well agriculture has always been the backbone of India for a long time. The project we put forth has been designed to minimize the work of a farmer so that he can tirelessly perform his farming tasks. We intend to automate the most common and frequent tasks of the farmer.

Our project focuses on compact designing and slight automating the tractor with battery powered motor so as to get daily farming tasks done with ease. Here we try to automate some farming tasks such as Weeding. The farmer will be provided with a throttle using which he may adjust the required speed and start or turn off the vehicle and control its movement. Also in future it can be fitted with a sprayer and water tank so farmer does not need to manually spray water over fields. Thus this agricultural robot is aimed to improve, automate tractor farming and make the work of a farmer easy.

## INTRODUCTION

“Farmers today spend a lot of money on machines that help them decrease labor work and increase yield of crops. There are various machines that are available for ploughing, harvesting, spraying pesticides etc., however these machines have to be manually operated to perform the required operations and moreover separate machines are used for every functions. The yield and profit returns from employing this equipment are very less as compared to the investment. Another issue is the growing demands of the world's population. The World Health Organization estimates that Earth's population will touch 9 billion in 35 years which will lead to a staggering demand in increase of growth of food crops. Automation is the ideal solution to overcome all the above mentioned shortcomings by creating machines that perform more than one operation and automating those operations to increase yield on a large scale.”

In order to address this problem a simple, economical & efficient machine remove weed ,ploughing & other operations , which would be operated by a single person which saves the person savings & labour time . The machine has been designed ,fabricated & tested.

A developing country like India is expected to continue to rely more on hand tools for the foreseeable future for cultivation. The use of hand tools for land cultivation is still predominant in India because draft animals and tractors require resources that many Indian farmers do not have easy access to. The need for agricultural mechanization in India must therefore be assessed with a deeper understanding of the small holder farmer's activities and what values farm power generated for them [1].

A **plants Plantation** is a specialized is a machine fitted with a Plantation mechanism (usually having some form of reciprocating motion) driven by the power from the live axle, in order to the transplant plants seedlings onto paddy field.

A common plants Plantation comprises:

The mechanical plants Plantation is fitted with a tin / aluminum based tray on which mat type nurseries are placed during the operation.

Multiple pickup forks that pick up a seedling from mat type nursery on the seedling tray and put the seedling into the earth, as if the seedling were taken between human fingers.

Machine transplanting using plants Plantations requires considerably less time and labor than manual transplanting.

## PRESENT THEORIES

- Efficient use of resources by saving on labour, cost saving, water saving.
- Timely transplanting of seedlings of optimal age.
- Ensures uniform spacing and optimum plant density with 2-3 seedlings/hills).
- Higher productivity compared to traditional methods.
- Less transplanting shock, early vigor of seedling, better tillering and uniform maturity of crop that facilitates timely harvest and reduces harvest losses.
- Less incidence of disease in seedlings due to less root injury.
- Improving soil health through eliminating puddling.
- Generates employment and alternate sources of income for rural youth through custom services on nursery raising and mechanical transplanting

## LITERATURE SURVEY

**Amritansh srivasatava [1] etal**, these worked on DTMF Based Intelligent Farming Robotic Vehicle. The main objective of machine can also be used to reach the places where farmers make harder efforts for farming such as hill areas, mountains etc. where land is not plane. This is how we can use this robot in different fields as well as for research purpose by further manipulation in programming it can be modified accordingly.

**R.suresh [2] etal**, this extensive work on automatic feeding device in rotary cultivator blade shaft welding equipment. It can achieve automation of grab, feeding and placement of all blade holders and assures that the blade holder feeding device and other devices in welding equipment work coordinate automatically. it can replace a universal robot to realize welding automation of the shaft weldment. Moreover the biggest advantage of it is easy to operate and low cost.

**Amrota sneja [3] etal**, in this research paper agricultural robot for automatic ploughing and seeding. The concept of fruit picking and pesticide spraying is described under the process domain. Farmers today spend a lot of money on machines that help them decrease labor and increase yield of crops but the profit and efficiency are very less. Hence automation is the ideal solution to overcome all the shortcomings by creating machines that perform one operations and automating it to increase yield on a large scale.

**Simon balckmore [4] etal**, in this paper robotic agriculture the future of agricultural mechanization. Developed agriculture needs to find new ways to improve efficiency. One approach is to utilize available information technologies in the form of more intelligent machines to reduce and target energy inputs in more effective ways than in the past. Precision Farming has shown benefits of this approach but we can now move towards a new generation of equipment. The advent of autonomous system architectures gives us the opportunity to develop a complete new range of agricultural equipment based on small smart machines that can do the right thing, in the right place, at the right time in the right way.

### 1. PROBLEM DEFINITION

Another method of weeding is with the help of a simple device consisting of metal. This metal tube with a handle on it is attached to a plough. When the plough moves over the field, the tube attached to it softens the soil and makes it applicable for making rows. It softens the soil & unwanted grass gets pulled out of soil. But Efforts required are higher which results in fatigue to farmer [2]. Efforts required for this operation are much and also time consumption is higher.



**Figure 01 Existing system for ploughing**

## **OBJECTIVE OF COMPLETE PROJECT WORK**

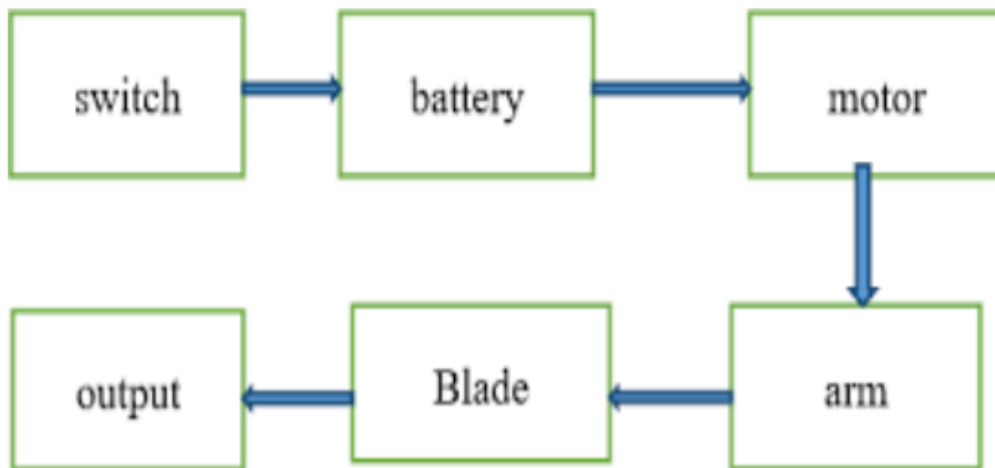
1. Efficient operation
2. To achieve plantation
3. Easy to operate
4. Simplified design and easy to manufacture
5. Low cost machine.
6. Easy to understand.
7. Highly precise.
8. Less maintenance.

## **SCOPE OF OBJECTIVES**

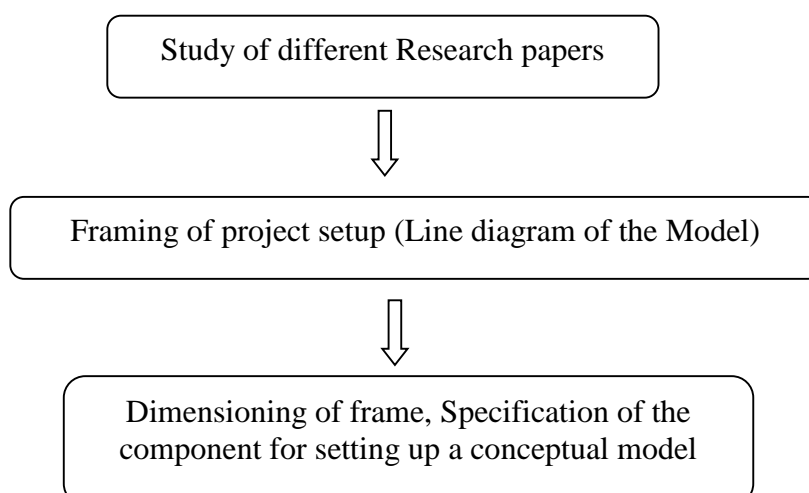
The major concept of fruit picking and pesticide spraying is described under the process domain. Farmers today spend a lot of money on machines that help them decrease labor and increase yield of crops but the profit and efficiency are very less. Hence automation is the ideal solution to overcome all the shortcomings by creating machines that perform one operations and automating it to increase yield on a large scale.

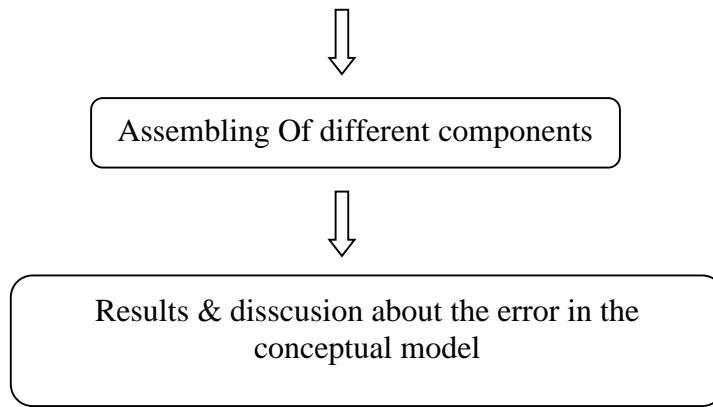
## **PROJECT CONCEPT**

To achieve the best performance from a ploughed machine, the above factors are to be optimized by proper design and selection of the components required on the machine to suit the needs of the crops. The ploughing or weeder can play an important role in manipulating the physical environment. The metering system selected for the seed should not damage the seed while in operation.

**BLOCK DIAGRAM:****FABRICATION DIAGRAM :****METHODOLOGY**

The basic objective of weeding operation is to remove unwanted grass in rows at desired depth. The recommended seed to seed spacing and depth of seed placement vary from crop to crop and for different agro-climate conditions to achieve optimum yields [1].

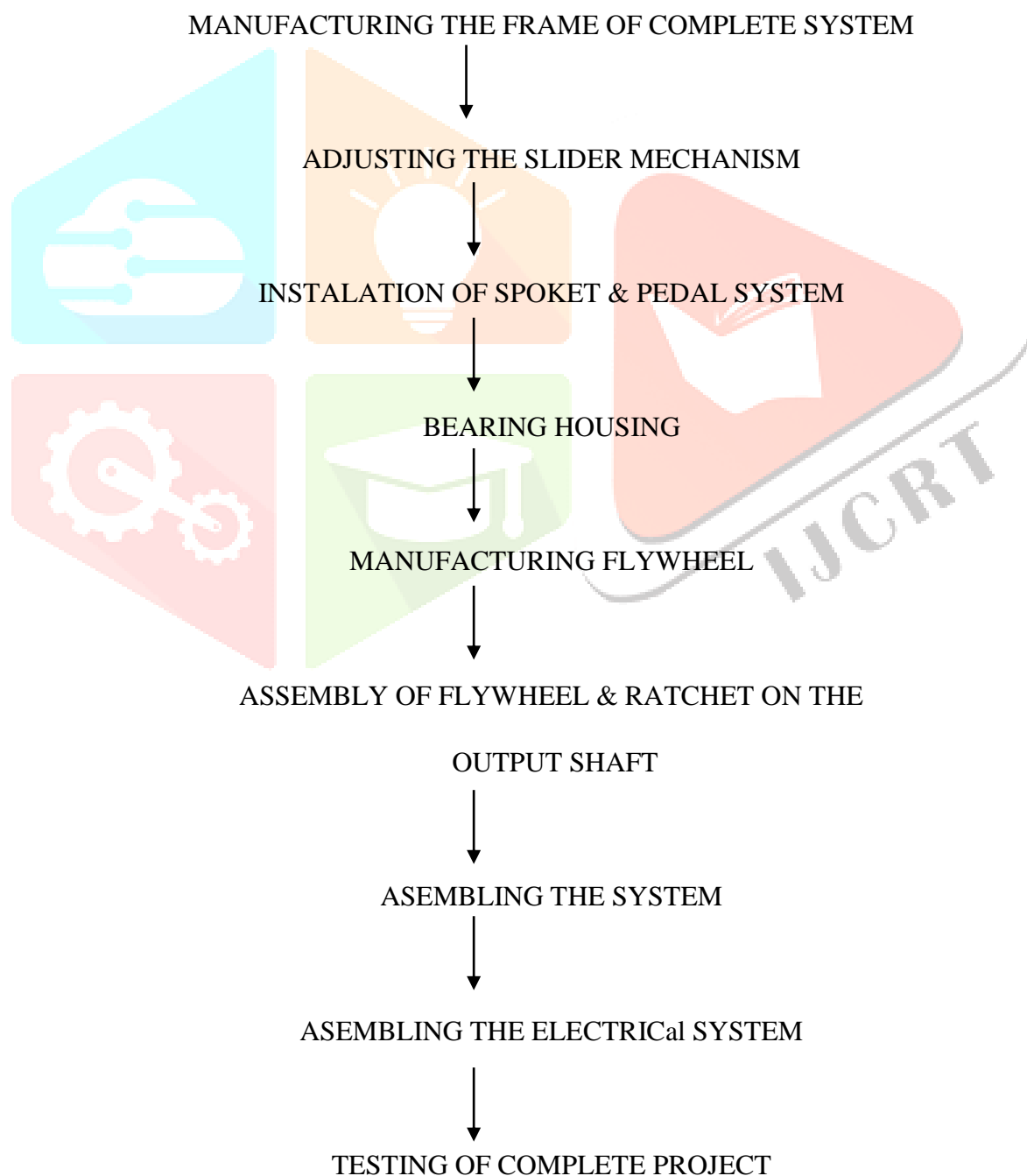
**METHODOLOGY OF WORKING PROCESS**



**Fig. 5 Flow Chart For Working Process**

## MANUFACTURING

Manufacturing flow chart :



**DIAGRAM : 3 MANUFACTURING PROCESS FLOW CHART****ADVANTAGES :**

1. Easy in operation, Low cost, Light weight.
2. Power saving, No skill operator required, adaptable.
3. Simple construction, Automation can be implemented.
4. High performance, Multi-operational, Time saving.
5. Pure mechanical, easy maintenance.
6. One labour is enough for operation.
7. Working is very easy compared to primitive work method.
8. Environmental friendly

**DISADVANTAGES:**

1. Machine performs multi-operations hence unemployment increases.
2. Emission of harmful gases to the environment.
3. Produces less power as compared to bulky.
4. Agriculture vehicle like tractor etc

**FUTURE SCOPE**

1. Automation of m operated machine.
2. Use IC engine to give power.
3. Sensor powered automatic planting system

**CONCLUSIONS**

The need of a poor and small land farmer has fulfilled by the manual ploughing and they can easily and effectively plough their seed in the field by these planters. But due to different crops have different requirement for the ploughing in the field. So the usefulness of the ploughing planter is limited. Hence the requirement of the motorized operated ploughing is very high.

**REFERENCES**

- [1]. Kalay khan, S.C. Moses, Ashok kumar “A Survey on the Design, Fabrication and Utilization of Different Crops Planter” European Academic Research - vol. iii, July 2015.
- [2]. D.N.Sharma and S. Mukesh (2010) “Farm Machinery Design Principles and Problems” Seciond revised edition Jain brothers,New Delhi
- [3]. Adisa A F, Braide F. G, “Design And Development of Template Row Planter”, Transnational Journal of Science and Technology August 2012 edition vol. 2, No.7

- [4]. Bamgboye, A.I and Mofolasayo, A.S 2006. "Performance Evaluation of a Two-Row Okra Planter". Agricultural Engineering International: the CIGR Ejamal. Manuscript PM 06002. Vol.viii. July.
- [5]. Kumark,K, Naresh N.K. and Ojha, T.P. 1986. "Design, construction and Performance of a manually-operated seeding attachment for an animal drawn cultivator". Agricultural Mechanization in Asia, Africa and Latin America. Vol.17, No.2, pp.35-38.
- [6]. Abubakar, "The Principle of Jab Planter in Applying Fertilizers", 1987
- [7]. Adekoya, Buchel"Developed A Cam Activated Precision Punch Planter",Transnational Journal of Science1987.
- [8]. Kepner, R.A; Bainer, R. and Barger, E.L. 1978. Principles of farm machinery. 3rd Edition. West port. G; AVI publishing company
- 9]. Afzalinia, S; Shaker, M and Zare, Z. 2006. Performance evaluation of common grain drills in Iran. Canadian Bio-system Engineering/Le genie des bio systems au Canada 48:2.39-2.43
- [10]. Anderson, C.R (2002). Okra. Home Gardening Series Division of Agriculture, Cooperative Extension service, University of Arkansas.
- [11]. Braide, Ahmadu, "Developed a Transplanter for some selected Crops", Guinea Savannah of Nigeria, 19

