# Automatic Rice Planter

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*Abstract--* **India is one of the major rice producing and consuming countries in the world. In India, transplanting of the paddy.In changing scenario of agricultural mechanization, ergonomics Plays crucial role for effectiveness of the operation. Therefore the study was undertaken to evaluate the paddy transplanting operation on ergonomic basis and to work out the energy expenditure rate involved in the operation. Manually operated six row paddy transplanter was selected for the study and the male and female subjects selected randomly in the age group of 25-35 years operated it. The heart rate (HR) of the subjects was measured by computerized polar heart rate monitor (HRM) and it was taken as a base to work out energy expenditure rate.**

**A Novatech load cell with digital indicator was used for themeasurement of push-pull force. The field capacity of six row manually operated paddy transplanter was found to be 0.38 ha day-1 while for transplanting by hand it was found to be 0.04 ha day-1. The average energy expenditure for male and female workers for transplanting operation by manually operated paddy transplanter was found to be 30.70 and 32.58 kJ min-1, respectively. The operation was graded as 'heavy work' on the basis of heart rate. The rest pause, for achieving functional effectiveness during transplanting the paddy by six-row transplanter, was found to be 14.30 min followed 30 minutes of work. More force in pulling the transplanter in forward direction is required by the subjects as compared to handle up and handle down operation.**

**The average force required for pulling the trasplanter was 130.32 and 145.12 N for male and female subjects, respectively. More force is required for female workers as compared to male workers because of males are taller and thus exerted a more upward-oriented force on the unit.**

## I. INTRODUCTION

India is one of the major rice producing and consuming countries in the world. Rice is also the single most important crop in Indian agriculture.

Paddy is grown in about 44.55 Mha in India (22.8% of the total cropped area) and has the largest acreage in the world after China. It is the staple food for two-thirds of Indian population and provides 20-25% of agricultural income.

Rice can also be grown in dry-fields, but from the twentieth century paddy field agriculture became the dominant form of growing rice. Paddy fields are typical in feature of rice-growing countries of east and southeast Asia, including Malaysia, Nepal, China, Sri Lanka, Myanmar, Thailand, Korea, Japan, Vietnam, Taiwan, Indonesia, India, and Philippines.

This Is Automatic Rice Planter.

Today Farminlong Process Take Very Long Time To Produce Peddy.

Today For Farming, Much Labour Work Required.

This lead to increase cost. Automatic rice planter is a machine that reduce manpower and give more time to farmers.

There are already so many rice planter machine available but we are intend to make it at less cost.

## II. WORKING

This machine basicallly works on automaic motor that rotary motion converted into reciprocatig.

Peddy seedlings are kept in the tray and allowed to flow down under gravity.

The fork which is attached to shaft picks up the seedlings from theand keeps it in horizontal position on the skid.

The motion for the shaft is given by hand using chain and sprocketarrangements,

Here simple is we will used 2 stroke petrol engine.

## III. COMPONENTS

*Chains*

The chains are used to transmit the power from hand driving wheel to the shaft in which forks are attached and it is also to transmit the power to the four bar mechanism.

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*Sprockets*

- We use Sprockets for hand driving wheel and in the shaft for rotating the fork and four bar mechanism.

*Calculation of Speed of Rotation*

$Z_1$=No. of teeth on sprocket pinion

$Z_1$

$Z_2$=No. of teeth on sprocket wheel

$Z_2$

$N_1$=Speed of rotation of pinion

$N_1$

$N_2$=Speed of rotation of wheel

$N_2$

Speed of wheel driven by hand

$N_2$=25 rpm

(optimum value)

No. of teeth in sprocket wheel

$Z_2$=40

$Z_2$

No. of teeth in sprocket pinion

$Z_1$=18

$Z_1$

Transmission Ratio 'i'

$N_1/N_2 = Z_2/Z$

$N_2$

$Z$

$Z_1$

$Z_2/Z_1 = 40/18$

$Z_1$

= 2.2

Therefore,

$N_1$ = 2.2 x 25

1

Speed of rotation of pinion

= 55rpm.

*TRAY*

Tray is used to keep the paddy seedlings on the transplanter.

Sheet metal is metal formed by an industrial process into thin, flat pieces.

*DIMENSIONS OF TRAY*

Length of sheet metal

= 53.5cm

Breadth of sheet metal

= 26 cm

Thickness of sheet metal

= 0.1cm

*SHAFT*

Shaft is a revolving rod that transmits motion or power

Here, the one shaft contains forks and another shaft contains

four bar linkage and power is taken from the hand driven

wheel by chains and sprockets.

*SHAFT DIMENSIONS:*

Length of the shaft = 30 cm (it is space required between the paddy seedlings)

Diameter of shaft

= 2 cm (it is t0he optimum diameter for

30cm shaft)

*FORK*

Fork is used to pick up the paddy seedling from tray and to keep it on skid.

There are two forks attached to shaft and distance in between two fork is 30cm.

The motion to fork is giving by shaft.

Total length of fork is 28cm.

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*Two Stroke Petrol Engine:*

- displacement : 58 cc

- fuel tank capacity : 550 ml

- chain oil tank capacity : 260 ml

- fuel consumption : 1. 00 ltr. / hrs.

- high speed : 11000 rpm

- fuel / ratio : petrol with 2t oil / 25:1

- chain pitch - guage 325" - 0. 058"

- bar length : 46 cm (18")

- rated power : 2. 3 kw / 8500 rpm

- chain : american chain

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