International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 06 Issue: 05 | May - 2022 Impact Factor: 7.185 ISSN: 2582-3930

Design and Development of Electric Sugarcane Cultivator Machine

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Abstract: We are presenting paper on "Electric Sugarcane Cultivator Machine" which finds application in agriculture equipment's like, cultivation of sugarcane. As the prices of cultivation and planting of sugarcane by cultivator machine is very high. In India, Sugarcane planting done about 6 to 8 tones seed per hector cause to excess labor required for plantation and the energy consumption for sugarcane cultivation is highest as compared to other crops like, wheat, potato, corn, rice, sorghum . Generally in market petrol or diesel engine cultivators machines are available, initial cost of this machine are too high and it's not easy buy a machine to every farmer's, so we can try to make the solar power operated electric sugarcane cultivator machine which is run by electric motor and it's comfortable to farmer's to use machine with low cost operation. Also, we add some sensors in machine like, 'Arduino Unit' which is used to turned on/off the machine via Bluetooth remote. This project aims to design and fabricate sugarcane planting/cultivation machine for cultivation of sugarcane and to reduce the farmer's effort and to increase in production of vegetative products.

I. INTRODUCTION:

Today in every country every task has been made faster with the help of machines, but the machines having high initial cost that demands huge investment & expenses. In India agro sector has facing shortage of agricultural labor, Due to shortage of labors farmer's demand cultivation machines. The agro sector has confronting genuine difficulties like shortage of rural work, in top working season as well as in typical time.

In regular strategy for establishing sugarcane sets are established physically in wrinkles, opened physically followed by conveying physically. This is then covered physically or by creature worked grower. In this manner, the cycle is a lot of tedious and work escalated. Numerous Tractor worked sugarcane grower have been created. In any case, the sugarcane grower which are at present accessible in the market are huge in size and worked with the assistance of weighty farm vehicle. Thus, they can't be worked in more modest grounds.

Sugarcane fundamentally developed for its juice from which sugar is made. The greater part of the world's sugarcane is filled in subtropical and tropical regions. A cultivator is a rural hardware utilized for sugarcane development with assistance of cultivator the dirt is hauled through directly or in revolving movement.

Sugarcane is also called as 'wonder cane' attributable to its flexible utility and the tremendous capacity to fulfill the needs of the thriving population. It is used in manufacturing of sugar, bio-fuels, spirit besides generation of electricity. This specific area has achieved the most advantaged status as one of the essential farming based industries. Also the agro based industries provide unrefined raw materials for papers, fertilizers, considerably higher in tropical and sub-tropical areas compared to rest of the globe.

Figure No.1 – Cultivator Machine

II. Problem Statement:

As the prices of cultivation and planting of sugarcane by cultivator machine is very high. In India, Sugarcane planting done about 6 to 8 tones seed per hector cause to excess labor required for plantation and the energy consumption for sugarcane cultivation is highest as compared to other crops like, wheat, potato, corn, rice, sorghum. Generally in market petrol or diesel engine cultivators machines are available, initial cost of this machine are too high and it's not easy buy a machine to every farmer's.

Sugarcane creation is an intricate cycle and can be considered as a component of a few factors. The information on the general significance of the asset inputs impacting sugarcane creation is fundamental for the sugarcane cultivators for presenting helpful changes in their activity at the miniature level.

Figure No.2 – Sugarcane leaves and deposits after development

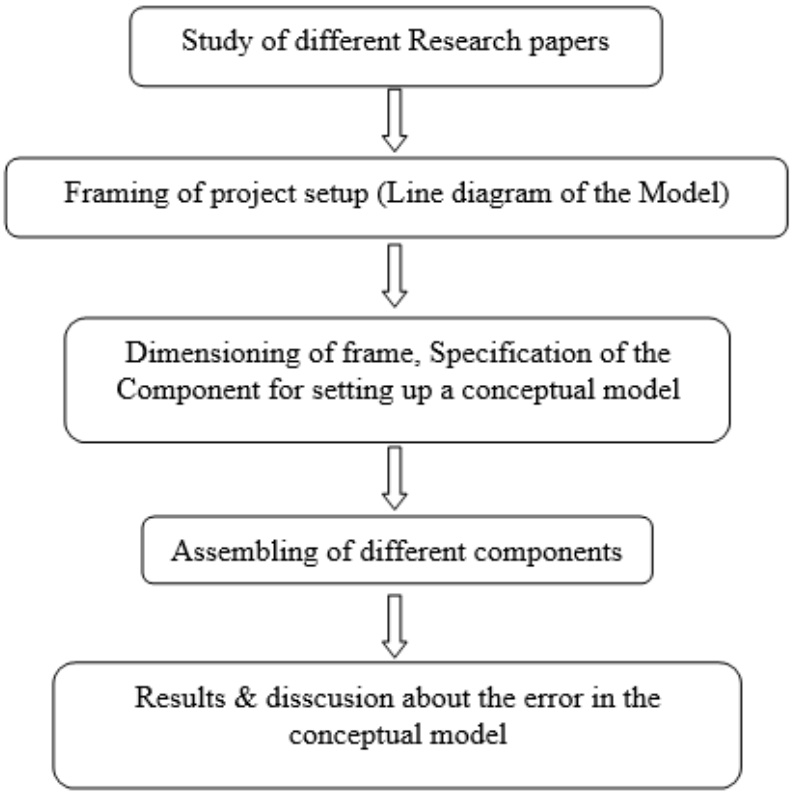
III. OBJECTIVES:

A two-wheeled work vehicle has some fitness in pulling any of various types of executes, while rotational turners address huge master in soil refined with their submitted burrowing devices. Essential and discretionary soil control is the key development expected for the movement of any kind of thing. Soil working instruments, for the model, structure load up wrinkles, plate crimps, and edges has for quite a while been seen and sensibly used by farmers under generally common field conditions. The fundamental focuses of the ongoing endeavor work are recorded underneath.

1. To develop a legitimate seedbed for the yields to be planted into, to cover crop buildup in the soil.
2. To control weeds, and to blend and join the dirt to guarantee the developing yield has sufficient water and supplements
3. The basic role of ploughing is to turn over the upper layer of the dirt, carrying new supplements to the surface.

IV. METHODOLOGY:

Procedure of working cycle:



In our undertaking to design a cultivator machine we have embraced an extraordinarily careful philosophy, the complete plan work has been partitioned into two sections essentially:

- System design
- Mechanical design

Methodology of Design & Analysis:

A limit study is done to survey the most imperative limits for FE assessment of center. Metal balls. The limits that are surveyed are network thickness, contact robustness, charm, load level, numerical nonlinearity and material nonlinearity. The examinations are performed through the FE programming Ansys. The accuracy of restricted part assessment depends upon different limits, for instance, part type, limit condition and how the loads are applied, etc. Subsequently the FE model isn't anything else aside from a vague affirmation of reality. The limit audit ought to be conceivable by real tests. At any rate, it will fabricate the cost, time and resources consumed and in this way FE assessment is more sensible choice, basically for limit appraisal.

Theoretical aspects of the work:

In this focus on the restricted part method is taken on including Pro Engineer and Ansys as a business CAD and FE program. Limited component procedure (FEM) is a method for harsh game plans of fragmentary differential circumstances. The going with segment contains a couple of fundamentals of the applied theories given that per client has a hidden data on fundamental essential mechanics, machine parts, and nuts and bolts of the restricted part methodology.

Ansys:

Ansys is a business, generally helpful FE programming which has been Javailable start around 1971. It might be used in a couple of utilizations for example to focus on the warm hotness stream, fluid stream, alluring fields, acoustics/vibrations and to wrap things up hidden mechanical issues.

- **Contact in Ansys:** A small bunch of ways of dealing with contact are accessible in Ansys. In any case, the one portrayed here is punishment based contact since it gives short computation times and along these lines is utilized.

- **Penalty based contact:** Whenever a punishment based contact is utilized, Ansys adds a spring coefficient (k component) when two surfaces interact with one another, to forestall entrance and to move load. (Figure 2.7) However infiltration will happen to move force, which isn't true in all actuality. Hence the punishment based strategies are delicate to the decision of the spring coefficient. The spring coefficient Ansys utilizes during estimations is the item between the "typical firmness factor" determined by the client and a reference factor determined by the program. An extra angle (aside from the precision) to think about while choosing the "typical solidness factor" is the assembly conduct. A stiffer contact will bring about more estimation cycles, since skipping could happen.

V. CONSTRUCTION & WORKING:

The main constructional components of the project are below:
DC Motor, Battery, Power controller, Arduino unit, Solar panel, MS tubes, bearings, sprocket, chains.

"Electric Cultivator Machine" which observes application in farming equipment's likes cultivation of sugarcane. By and large, in market petroleum or diesel motor cultivator's machines are accessible, starting expense of this machine are very high and its difficult purchase a machine to each rancher, so we can attempt to make the sun based power worked electric sugarcane cultivator machine which is controlled by electric engine and it's agreeable to ranchers to utilize machine with minimal expense activity. With the help of Ms Tubes we made main frame body structure. For the soil cultivation and ploughing we are using the 750watt DC electric motor to run the machine. To start the machine with the help of Arduino unit. The main concept of this project to reduce the machine purchasing cost and pollution free environment.

Conceptual Diagram of Electric Sugarcane Cultivator Machine:

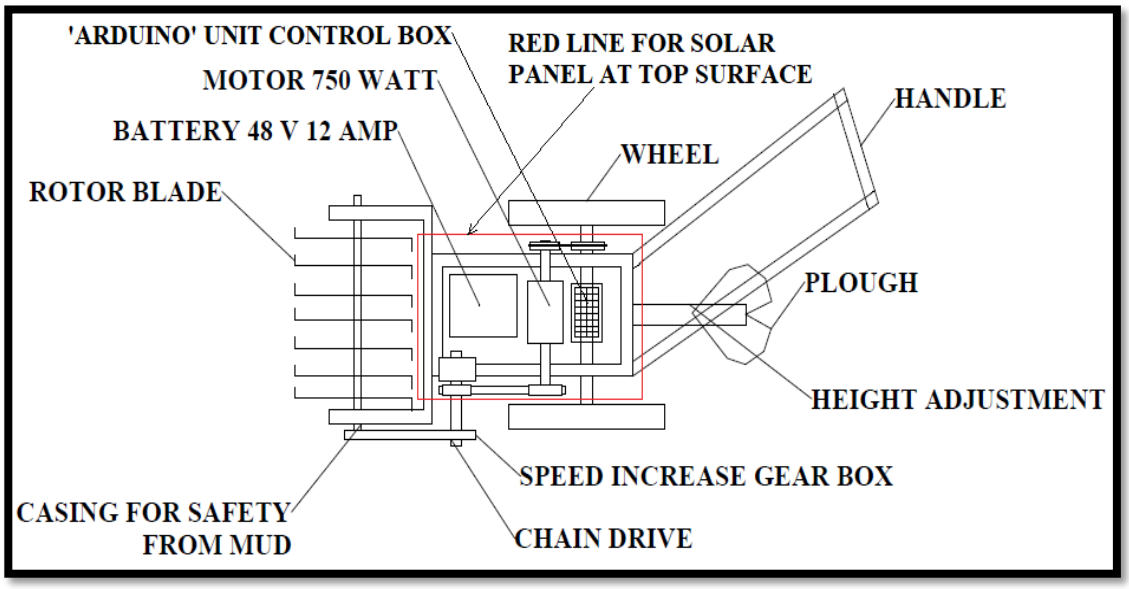


Figure No.3 – Conceptual Block diagram

Component specification:

1) E-Bike DC motor:
A direct current (DC) motor is a type of electric machine that coverts electrical energy into mechanical energy. DC motors take electrical power through direct flow, and convert this energy into mechanical turn.
The stock voltage range is 12-48V with the extremity markers at the base of the motor. With the assistance of electric bike engine, we play out the genuine work at the farm.

Motor Specifications:

- Rated Operating Voltage: 48V
- Rated Power: 800W
- No Load Current: 4.0A
- No Load Speed: 450 RPM
- Rated Torque: 102Kg-cm
- Rated Speed: 350 RPM
- Rated Current: 15.6A
- Efficiency: 80%
- Gear Ratio: 6:1
- Wight (approx.) = 5 kg

Figure No.4 – DC Motor

2) Controller:

It has a rotor with extremely durable magnets and a stator with windings. A brushless DC motor regulator utilizes sensors to indicate the rotor's situation. It switches the current in the windings with the assistance of semiconductors.

Controller Specifications:

- Rated voltage: DC48V
- Rated power: 800W
- Rated current: 35A ± 1
- Under-voltage protection: DC41.5V+-0.5V
- Efficiency: ≥83%
- Consumption: <1.5

Figure No. 5 – Controller

3) Battery:

A twelve-volt battery has six single cells in series creating a completely energized yield voltage of 12.6 volts. A battery cell comprises of two lead plates a positive plate covered with a paste of lead dioxide and a negative made of sponge lead, with a protecting material (separator) in the middle. It is utilized to run the DC engine.

Battery Specifications:

Capacity = 12V 12Ah
Battery type = Acid lead battery
Weight (approx.) = 2 kgs

Figure No.6 – Battery

4) Arduino Unit :

Arduino is an open-source electronics gadget based on view of simple to-utilize equipment and programming. Arduino boards can understand inputs - light on a sensor, a finger on a button, or a Twitter message - and transform it into a result - actuating a motor, turning on a LED, distributing something on the web.
It is microcontroller board unit based on ATmega328P microchip innovation.

Width x Height = 80mm x 20mm

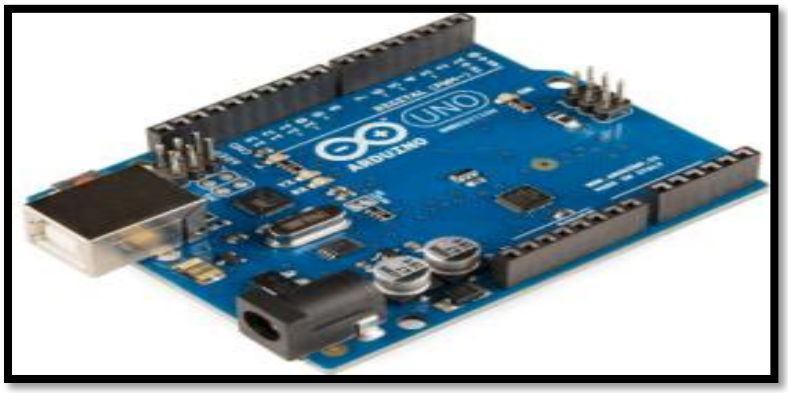


Figure No.7 – Arduino Unit

5) MS Square Tubes :

All Mild steel tubes utilized for making main frame.

Available size of tubes – 25x25mm, 1.5mm thick

Figure No.8 – MS Square Tubes

6) Sprocket & Chain:

Sprockets are strong wheels with teeth that lock onto a chain. As the sprocket turns, the teeth take hold of the chain and move different parts that interlock with the chain. These parts are frequently contrasted with gears, what share a comparative wheel-formed plan with teeth.

- chain size – 3/8”

A sprocket, sprocket-wheel or chain wheel is a profiled wheel with teeth that lattice with a chain, track or other punctured or indented material. The name 'sprocket' applies by and large to any wheel whereupon spiral projections connect with a chain disregarding it.

- 12/18/36 Teeth sprocket

Figure No.9 – Sprocket & Chain

7) Photovoltaic Solar Panel :

Photovoltaic (PV) panels are utilized to create power straightforwardly from daylight. PV boards comprise of various individual cells associated together to create power of an ideal voltage. Photovoltaic boards are innately DC gadgets. To create AC, they should be utilized along with an inverter.

It comprises of a few silicon precious stones; each PV cell is made of various silicon gem pieces that are merged together during assembling. Sun oriented module changes over inexhaustible light energy taken from the sun into electric energy.

Solar Panel Specification:

Wattage/Capacity = 75 watt
Voltage = 12V
Dimensions = L x W x H = 780 x 670 x 35 mm
Wight (approx.) = 6.26 kgs

Figure No.10 – Solar Panel

8) Plummer block bearing (P204) :

A cushion block bearing (or Plummer block) is a platform used to offer help for an alternating shaft with the assistance of viable course and different embellishments. The gathering comprises of a mounting block which houses a direction. The square is mounted to an establishment and a shaft is embedded permitting the internal piece of the bearing/shaft to pivot.

Figure No.11 – Plummer block bearing

9) Sheet Metal :

Sheet metal will be metal framed by a modern cycle into dainty, level pieces. Sheet metal is one of the key structures utilized in metalworking, and it tends to be cut and twisted into an assortment of shapes. Innumerable ordinary articles are created from sheet metal. Thicknesses can fluctuate fundamentally.

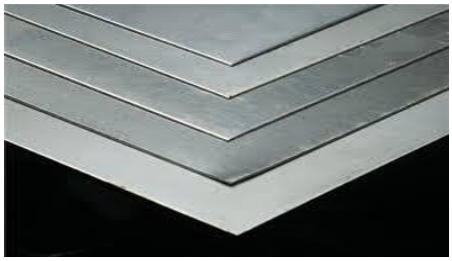
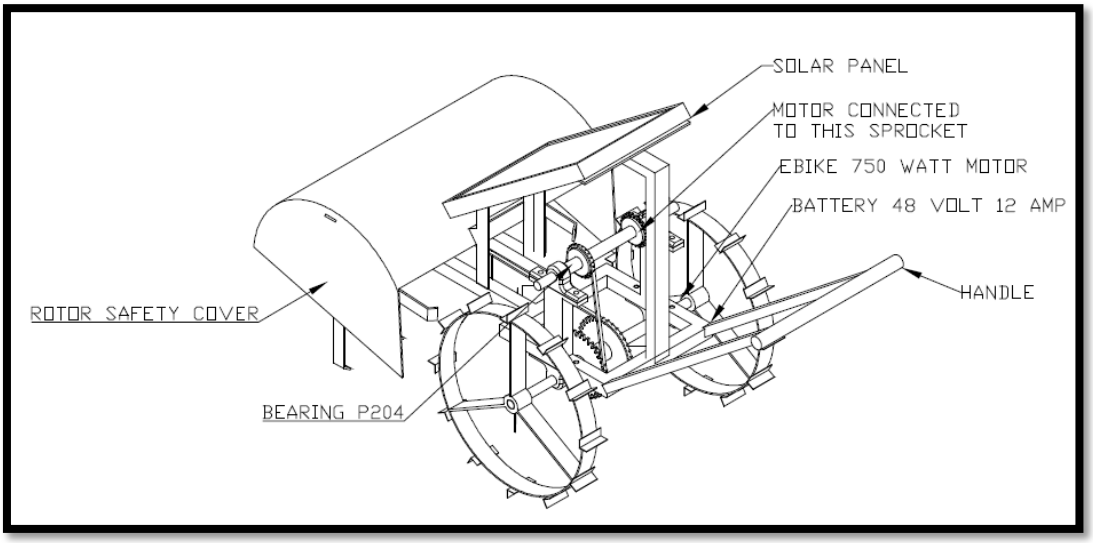
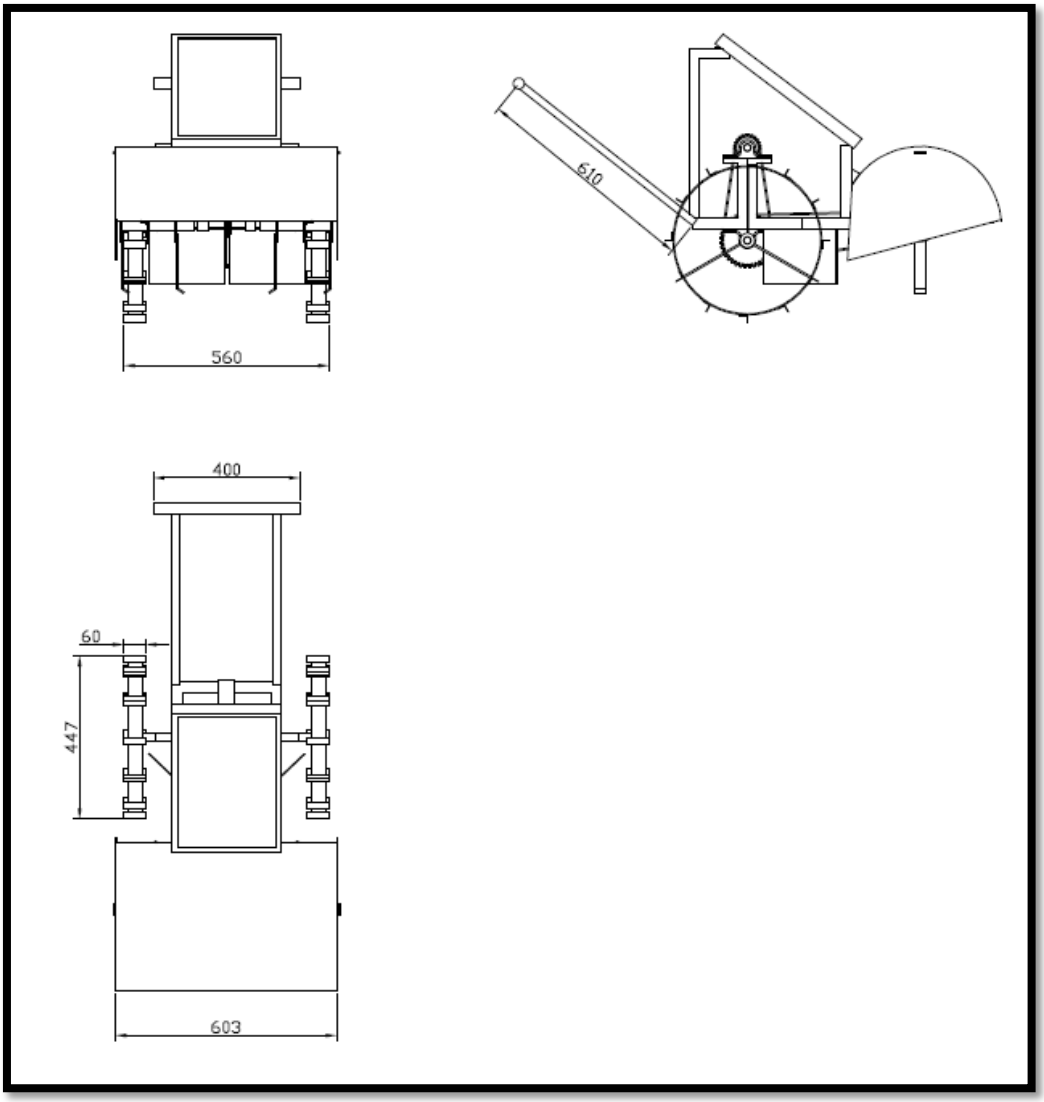


Figure No.12 – Sheet Metal

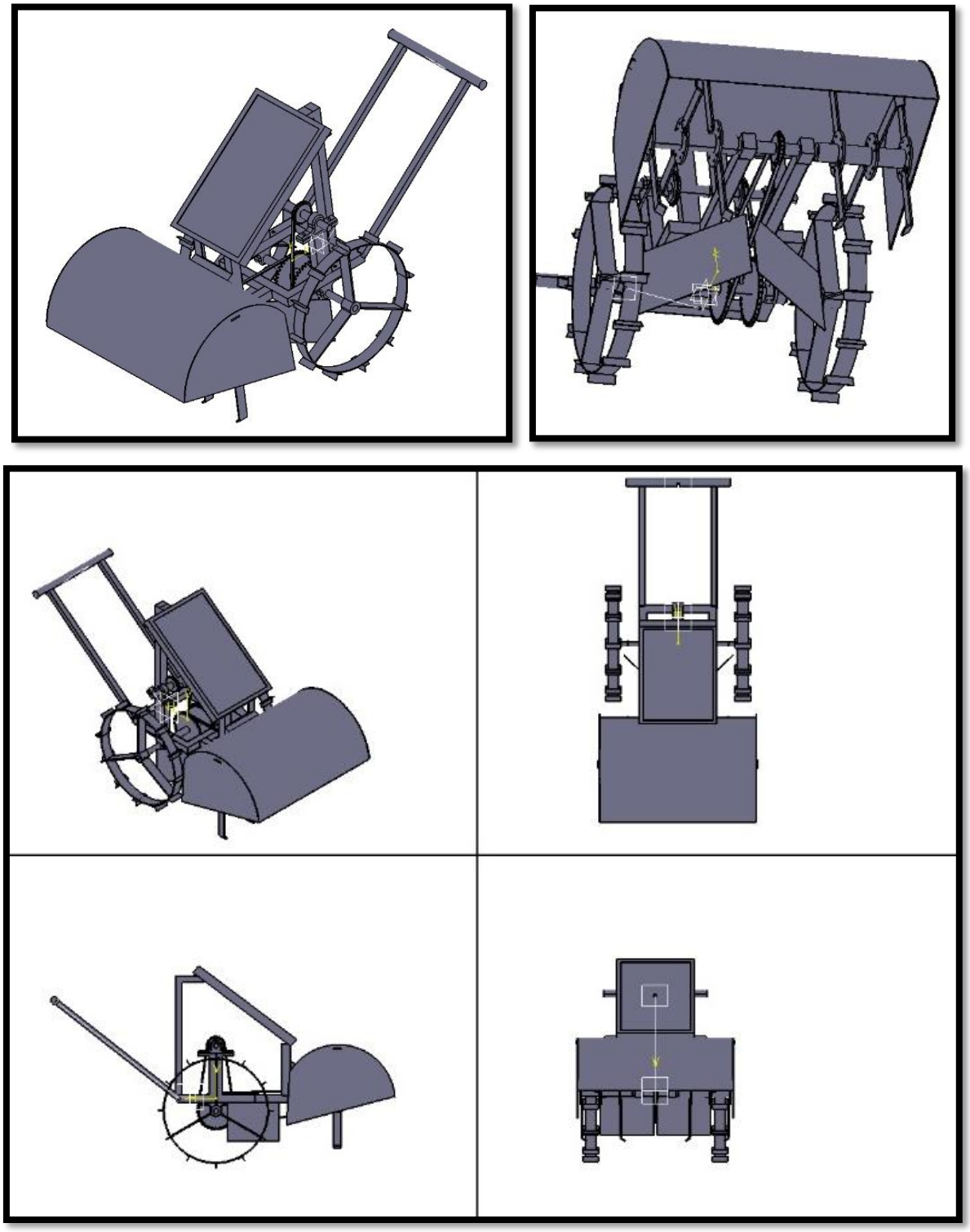
VI. DESIGN OF MACHINE:

AutoCAD drafting sheet:

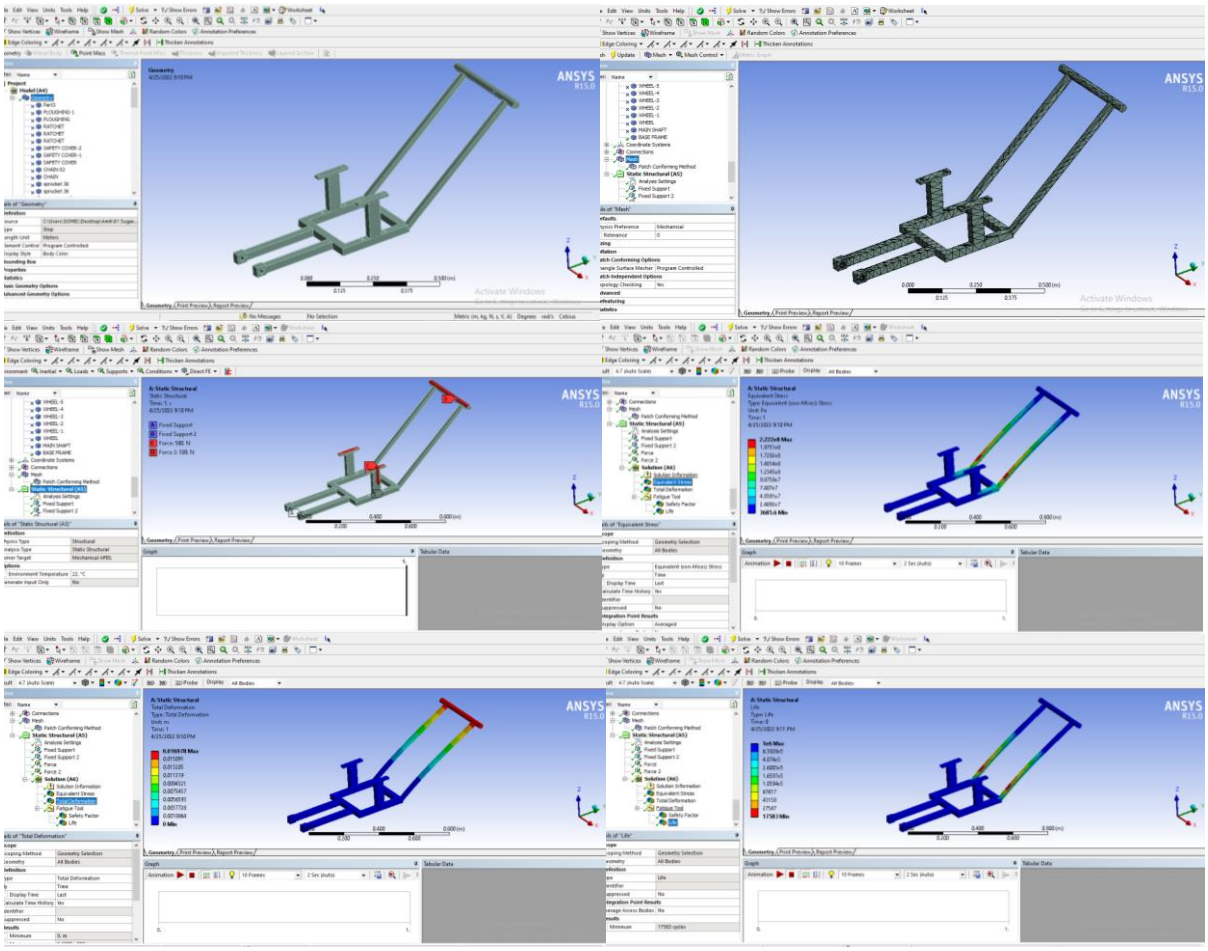




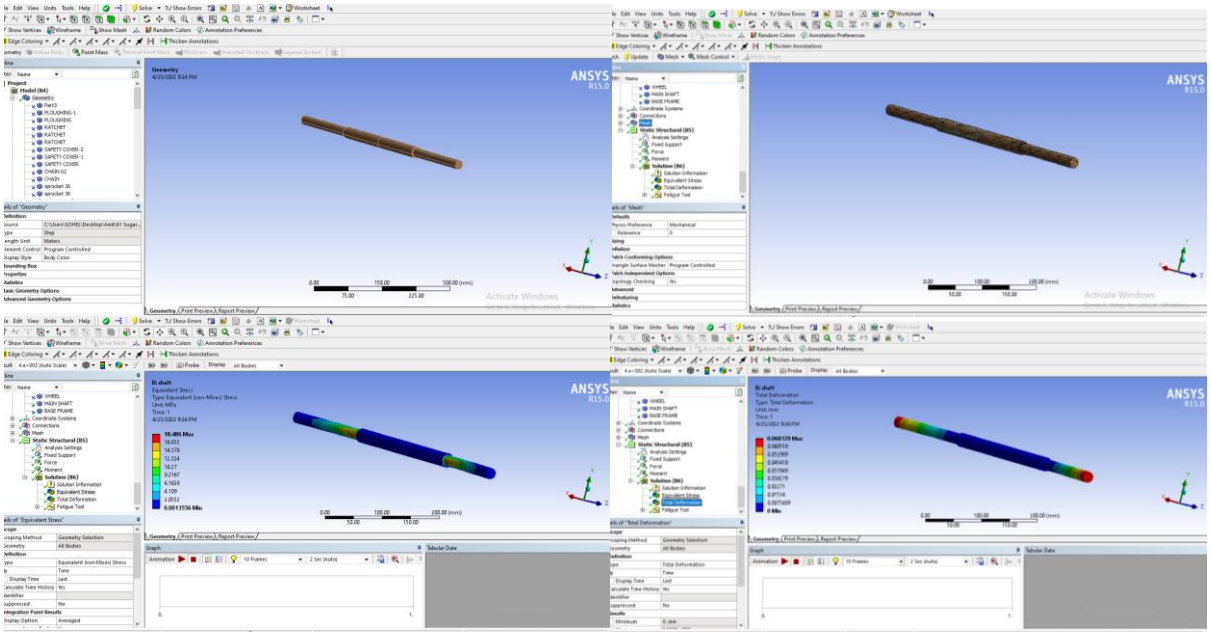
System Cad Design:

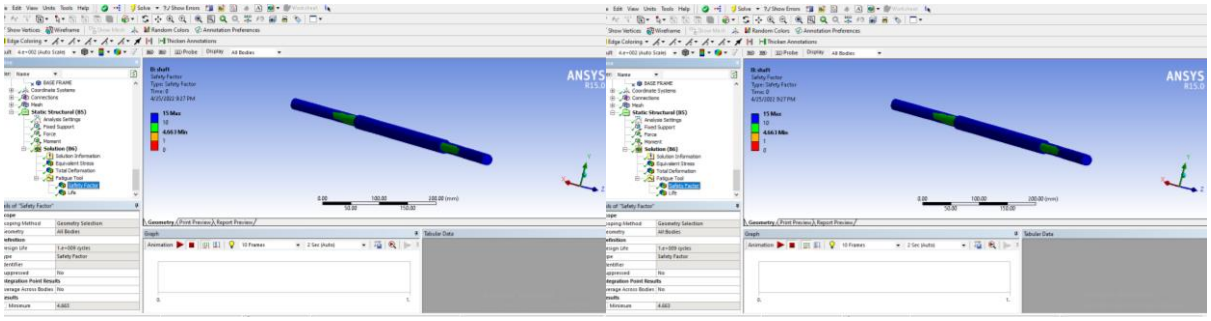


Analysis of base frame:

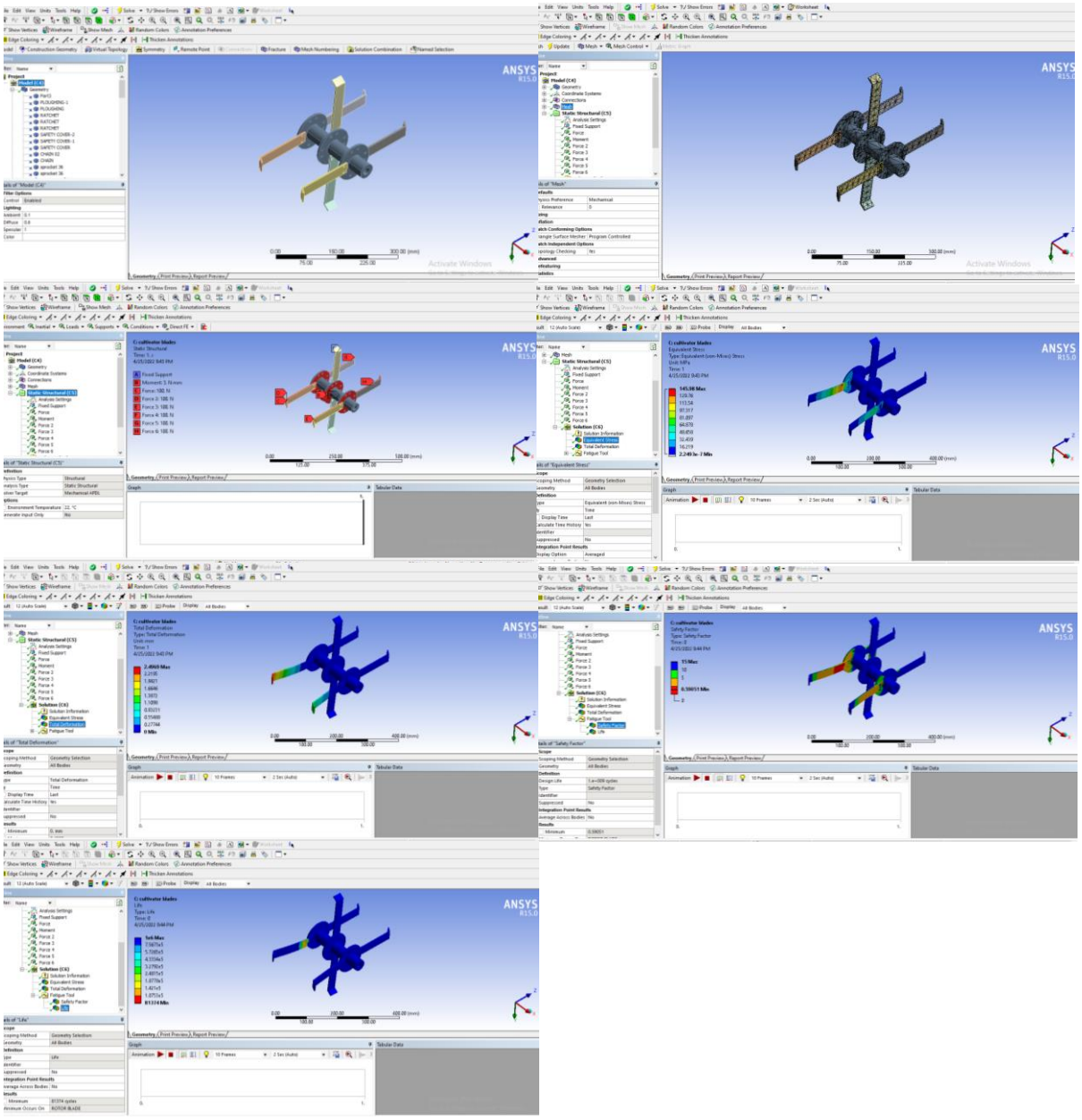


Analysis of main shaft:





Analysis of Cultivator blades:



VII. CALCULATIONS:

1) Frame Design :

The Frame manufactured for our undertaking which is comprised of M.S. It is welded as needs be for plan of the framework parts. The Frame alongside aspect is displayed in figure below:

Frame Specification:

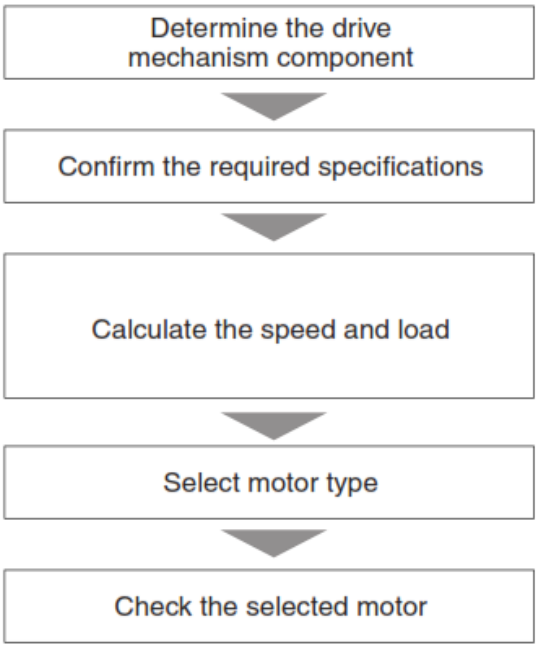
- Size of Frame: 450 x 250 mm
- Material of Frame: Mild Steel
- Loaded weight of frame: 55 kg

2) Battery Selection :

12V x12Ah = 144 watts (for one battery)
We are using 4 batteries = 144 x 4 = 576 watt
So, we are using battery of 576 Watt having efficiency 75 %.

3) Motor Selection :

Motor Selection:
This segment depicts specific things that should be determined to track down the ideal engine for a specific application. Choice strategies and examples are given.



1. To begin with, decide specific elements of the plan, for example, drive component, rough dimensions, distances moved, and situating period.
2. Affirm the necessary determinations for the drive framework and gear (stop precision, position holding, speed range, working voltage, goal, toughness, and so forth.).

3. Ascertain the incentive for load force, load latency, speed, and so forth. at the engine drive shaft of the component. Allude to page 3 for ascertaining the speed, load force and burden latency for different systems.
4. Select an engine type from AC Motors, Brushless DC Motors or Stepping Motors in view of the expected determinations.
5. Make a last assurance of the engine subsequent to affirming that the particulars of the chose engine/gearhead fulfill the prerequisites as a whole (mechanical strength, speed increase time, speed increase force and so forth.).

3.1 Motor Initial Movement Torque :

Suppose, 55 Kg of weight to be lifted.

- Force required = 55 x 9.81
  = 540 N

- Torque required = Force x Radius
  = 540 x 40 …… (Consider motor sprocket, OD = 3.14" ≈ 80mm)
  = 21600 Nmm
  = 21.6 Nm

3.2 Motor Initial Movement Power :

- Human walking speed = 300 mm/sec
  = 300 x 60 mm/min
  = 18000 mm/min
  = 18 m/min

- Wheel Curvature = 400 x π…… (Consider wheel diameter = 400mm)
  = 1256mm
  = 1.256m

- Speed of wheel = Human walking speed / Wheel curvature
  = 18 / 1.256
  = 14.33 ≈ 15 rpm

- Initial movement power: $P = 2\pi NT / 60$
  $= 2\pi \times 15 \times 21.6 / 60$
  = 33.92 ≈ 34 watt

- Gear ratio = Motor rpm / speed of wheel
  = 350 / 15 …… (Consider motor rpm = 350 rpm)

= 23.33 ≈ 24

…Gear ratio = 24: 1

4) Solar Panel Selection:

Capacity = 75 watt, Voltage = 12V

- One solar panel mounted on machine

Charging time of battery with the help of 75 watt solar panel

= Battery capacity / Solar panel capacity

= 576 / 75

= 7.68 hrs.

- But to reduce charging time of battery in future then we will add 3 more solar panels mounted on ground

= 75 watt x 4 (solar panel)

= 300 watts

So, we find,

= 576 / 300

= 1.92 hrs. ≈ 2 hrs.

Hence, we will achieve full battery charging within 2 hrs.

Note: Due to solar panel this electric machine is used in limited period like in summer/winter season.

5) Cultivator Machine Working Time:

Electric sugarcane cultivation machine run time with one time full charging of battery

= Battery Capacity / Motor Capacity

= 576 / 750

= 0.72 hrs.

= 44 minutes

VIII. ADVANTAGES:

1) In various words, it is an exceptional saver of time and expenses on field exercises.
2) Due to more humble size, two deals constructional plans, the soil turner and weeder become one of the lightest yet best estate power sources.
3) Its assignments are obliged by an overseer through its extended handles by walking around it.
4) One of the exceptional features of a soil turner and weeder is that it's both the wheels can finish two positions all the while.
5) It makes the soil turner and weeder push ahead through traction of its wheel with the ground and at the same time change the direction as chairman needs.

IX. DISADVANTAGES:

1) Less run times.
2) Battery cost is high.
3) It is more to Charge time for batteries.

X. LITERATURE SURVEY:

Research Paper 1:
Title: Design and Analysis of Sugarcane Cultivator
Authors: C.Arun ,S.Dinesh Kumar
The manual sugarcane development includes most extreme work, time and wages. In this situation, the inaccessibility or interest for work become an extremely enormous issue for rancher. Gradually, the work populace is moving from agrarian work to other new crisis areas like materials processing plants. Model, the crisis of different areas in and around town regions gradually depletory the asset of horticulture. In this arrangement, our task has been done in a method for decreasing the human requirements, time and costs in sugarcane cultivator. Utilization of hardware helps saving the work and season of tasks, lessens drudgery, helps in working on nature of work, diminishes cost of activity and guarantees viable use of assets.

Research Paper 2:
Title: Design, Development and Fabrication of Soil Tiller and Weeder
Authors: Md. Aqib Naque, Akhtar Ali Rizvi, Amogh v. Tijare, Prof. A. B. Tupkar
The dirt turner and weeder are one of the many homestead automations in advancing soil turner and weeders particularly considering the way that most of ranchers are having little land. It decreases human exertion. The carries out are generally independent. Working of the undertaking depends on motor and chain sprocket system which moves the shaper or turner. It is an incredible saver of time and costs on field activities. Accordingly, it will have exceptionally compelling purposes on the homestead field either for tiling as well concerning weeding. Advancement of high-limit energy proficient adaptable machines and mix apparatus for expanded work efficiency, diminished unit cost of activity, further developed idealness of activity and appropriate for custom employing.

Research Paper 3:
Title: Agricultural Mini Cultivator
Authors: Mr. K. Rahul, P. Sundar, B. Sadhik Ameen, K. Venkata Sai Teja, S. Sudheer Kumar Reddy.
Agriculture is the essential wellspring of the India populace. It assumes an essential part in the financial development of our country. In times past furrows are utilized to mix or culturing the dirt. These days farm haulers are utilized for various developments. The farm hauler is a designing vehicle extraordinarily intended for horticulture purposes. Numerous cultivators or cultivating hardware are appended to the farm hauler for culturing and mix the dirt. Utilizing the work vehicle is more costly for little ranchers. Plan and assembling of multifunctional agrarian machines by utilizing endlessly worm wheel gearbox predominantly utilized for entomb farming purposes. It is only a two-wheeled farm vehicle prevalently known as power turner.

Research Paper 4:
Title: Mechanization of Sugarcane cultivation
Authors: Javed Ali
Sugarcane is a significant money crop and developed between 320N to 320 S scope covering in excess of 90 nations of the world. India contributing 19.98% of the complete world creation is the second biggest

maker of sugarcane close to Brazil. In India sugarcane is developed in 4.86 million hectares with yearly creation of 324.91 million tons in the year 2010-11.The normal yield of sugarcane is around 67 tons for each ha, which is below the normal efficiency of Australia, Indonesia, Colombia and so forth. In India, it is become between 700N to 320N scope covering huge variety in environment, soil-crop spread and efficiency. The major delivering states are Uttar Pradesh, Maharashtra, Tamil Nādu, Karnataka, and Gujarat. The energy utilization underway of sugarcane is most noteworthy when contrasted with numerous different harvests, for example, potato, maize, wheat, paddy, sorghum and so forth.

Research Paper 5:

Title: Design and Fabrication of Power Operated Tiller Machine

Authors: Auti Omkar, Thorve Snehal, Unde Akshay, Wakchaure Suchit, Kolse Chandrashekhar

Weed control is perhaps the most troublesome attach an agricultural ranch. Three strategies for weed control are normally known in horticultural. These are mechanical, substance and natural control. Because of substance control technique soil get dirtied and it is destructive to our body. Natural strategy is less viable than other technique so these strategies are not valuable. Mechanical weed control not just evacuates the weeds between the harvests rose yet additionally keeps the dirt surfers free, guaranteeing better soil air circulation and water consumption limit weeding by power turner lessen the expense of work and furthermore save time. Different sort of mechanical weed has been created. In human worked weed solid power is required thus it can't be worked for long time. The Traditional strategy for hand weeding is tedious.

Research Paper 6:

Title: Design, Fabrication and Performance Evaluation of an Inter-Row Cultivator for Sugarcane Fields

Authors: Yuttana Khaehanchanpong, Tofael Ahamed, Tomohiro Takigawa.

The points of this examination were to plan and manufacture a between line cultivator for mounting on a medium-sized farm vehicle (25.3 or 37.3 kW) for sugarcane fields, and to survey the presentation of the cultivator while reaping is led either manually or with a sugarcane reaper. In addition, this study was additionally intended to evaluate the exhibition of the cultivator in blending sugarcane deposits in the field. The between column cultivator has a functioning width of 80 cm, a rotor shaft speed of 500 rpm, and an absolute weight of 518 kg. The cultivator contains 18 European C-type cutting edges connected to three circle holder spines organized in a winding development.

Research Paper 7:

Title: Comparative Performance Evaluation of Sugarcane Cutter Planters

Authors: Sukhbir Singh, P.R. Singh, A.K. Singh, Rajendra Gupta

India is the second biggest sugarcane (Saccharum officinarum) creating country after Brazil. It is developed in 5.14 million hectares region (around 3% of gross cultivable are in the country) with a creation of 359 million tons and 69.85 tons/ha normal efficiency (Anonymous 2016). Planting makes the establishment for a harvest and assumes a significant part in its development and yield (Singh and Vatsa 2007). Sugarcane planting includes seed setts cutting, wrinkle making; arrangement of seed setts, manure and synthetic substances and soil covering over setts which consumes around 35 man-days per hectare (Singh, P.R. et al 2013).

The majority of these tasks are being done physically with regular instruments and gear which are very time, work consuming and include parcel of drudgery which eventually expands the expense of activity and decreases the net benefit to the cultivators.

Research Paper 8:

Title: Semi-Automated Motorized Cultivator for Agriculture

Authors: Shreeshayana R, Manjunath V Gudur

Agriculture process incorporates Plowing, Planting, Watering, Weeding, Harvesting and Delivery. Among various techniques for weed controls in rural harvests, mechanical control has an extraordinary spot from the perspective of its viability, achievability and adaptability. The improvement of fitting automated weeding control is a requirement for expanding efficiency and diminishing the creation cost. The basic role of furrowing is to turn over the upper layer of the dirt, carrying new supplements to the surface, while covering weeds and the remaining parts of past ropes and permitting them to separate.

Research Paper 9:

Title: A review paper on Design of Sugarcane Trans planter Machine

Authors: Mr. Kushagra H.Patel, Mr. Pragnesh G. Patel, Mr. Sagar R. Patel, Mr. Nikesh K. Parmar, Mr. Jigar R. Tailor

In India agribusiness has confronting genuine difficulties like shortage of horticultural work, in top working seasons as well as in typical time. This is primarily for expanded nonfarm open positions having higher pay, movement of workforce to urban communities and low status of horticultural works in the general public.

In customary technique for establishing sugarcane sets are established physically in wrinkles, opened physically followed by conveying physically. This is then covered physically or by creature worked grower. Subsequently, the cycle is a lot of tedious and work serious. Numerous Tractor worked sugarcane grower have been created. However, the sugarcane grower which are as of now accessible in the market are huge in size and worked with the assistance of weighty farm hauler. Thus, they can't be worked in more modest grounds.

The machine is a minimized Sugarcane Planter which can be worked in more modest grounds by 2-3 works, accordingly diminishing the work cost and accelerating the manor interaction. This physically worked sugarcane grower will cut the sugarcane into two halves and will establish them at equivalent distance.

Research Paper 10:

Title: Status of farm Mechanization for Saccharum officinarum (sugarcane)

Authors: Avinash Kumar, Aaradhana Patel, Dhananjay M Kadam, Dr. Atul Kumar Shrivastava, Munish Kumar Pandey, RK Dubey and Dr. NK Khandelwal

The point of this study was to figure out the homestead automation status for saccharum officinarum (sugarcane) from the chose region of the review Narsinghpur, (M.P.) India.

Saccharum officinarum (sugarcane) was a significant money yield and it was developed between 32°N to 32°S scope covering in excess of 90 nations of the world. India contributing 19.98% of the complete world creation was the second biggest maker of sugarcane close to Brazil. Saccharum officinarum (sugarcane) was normally planted in the blustery period, among January and March, to be collected in the

accompanying yield season, causing a useful framework shortfall of one year. Saccharum officinarum (sugarcane) was more work serious expecting around 3300 man-hrs. per hectare for various activities. Considering the current pattern of accessibility of work for sugarcane creation, it has been capable that the utilization of present day apparatus is unavoidable.

Research Paper 11:

Title: Mechanization in Sugarcane: Need of the hour

Authors: Lalita Rana, Navnit Kumar, Anil Kumar, Sunita Kumari Meena, Manish Kumar

Sugarcane is a long term perpetual yield has a place with the family Gramineae. It is cash cum modern harvest requires around a year or something else for their development and improvement so require big number of works for development. Sugarcane gives work to the provincial individuals round the year. It is developed in a space of Sugarcane area of 5.06 million hectare and creation of around 405.42 million tones with normal efficiency of 80.10 t/ha during 2018-19. The energy utilization underway of sugarcane is higher than different yields like maize, potato, wheat, rice, and so on. The harvest expects around 375 man-days/ha for various agronomic practices.

Research Paper 12:

Title: Present Mechanization status in Sugarcane – A review

Authors: Kishore N., Gayathri D., Venkatesh J., Rajeswari V., Sangeeta B. And Chandrika A.

The yields developed by the Indian ranchers incorporate different food crops, business crops, oil seeds and so on; sugarcane is one of the significant business crops filled in India. The region under sugarcane is covering around 5.08 million hectares and with a normal yearly creation of 350.02 million tons in the year 2013-14 and with a normal efficiency of 68 tons/ha. India is a second biggest maker as well as customer of the sugar on the planet and during 2014-15; it created 28 million tons of sugar, which was almost 11.8 percent of the complete sugar creation of the world. The major delivering states are Uttar Pradesh, Maharashtra, Tamil Nadu, Karnataka, Gujarat and Andhra Pradesh. However, the region under development of sugarcane is more on the planet as well as in the country, the degree of work consuming is more and motorization is less and furthermore the energy utilization in sugarcane creation is more when contrasted with different yields like paddy, wheat, potato, maize, and so forth.

XI. CONCLUSION:

The result from this above project results are affirmation of much efficiency, less drawn-out, worker pleasing machine isolates to the customary method for furrowing. It promises you of most noteworthy work wrapped up with least work effort.

XII. FUTURE SCOPE:

1. Utilizing of electric machines for all agribusiness area to lessen contamination.
2. Natural control can be used for bugs that hurt the adequacy of the weed.
3. Plant, animal and smaller than usual living things may be used for decimation of weeds.

4. This method requires greater chance to work so this procedure not suitable for weed control.
5. As hand weeding is costly, automated structure could be reasonable and mechanical weed control system can reduce or clear out the prerequisite for artificial materials.

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