MAHUVA NUT CRACKER

TEAM MEMBERS:-

1. **PANDYA PRITISH** **(ATMIYA INSTITUTION,RAJKOT)**
2. **PANDYA DHYEY** **(J.N METHA POLITECHNIC, AMRELI)**
3. **MODHA BHAVIK** **(** GOVERNMENT POLITECHNIC,PORBANDAR)
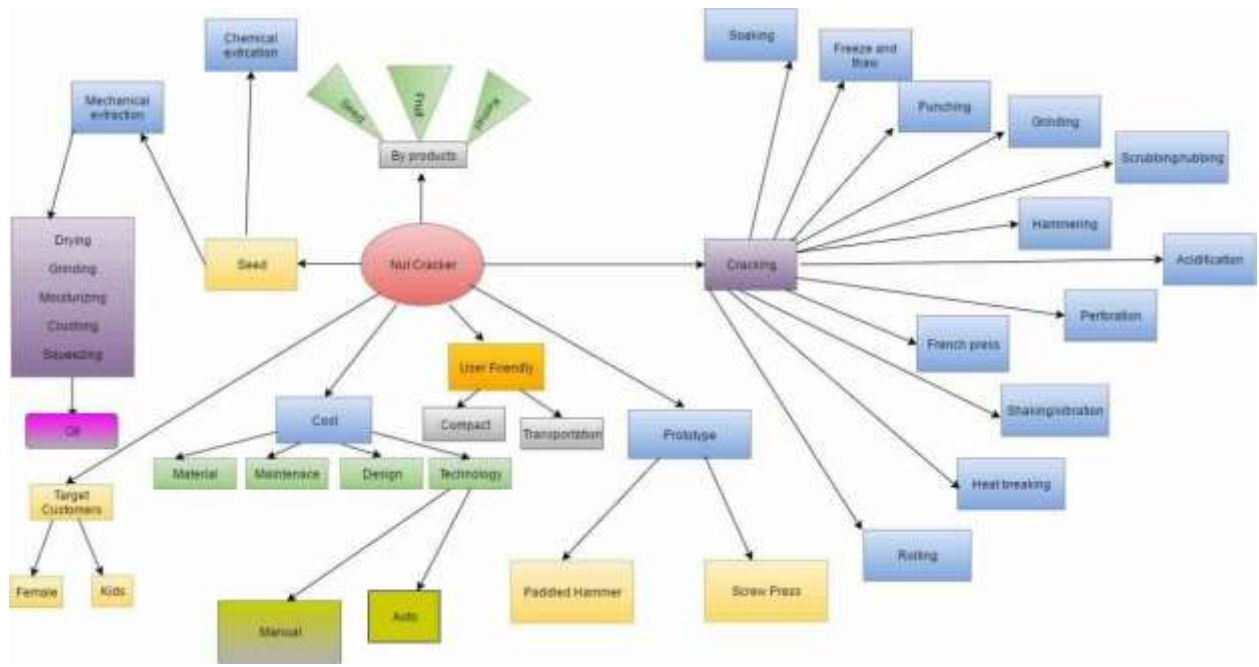4. **MEGHNATHI VIKAS** **(** GOVERNMENT POLITECHNIC,PORBANDAR)

INTRODUCTION

Mauva tree can be found in topical region, this tree is also can grow flowers. Both nuts and flowers can useful in daily life. Mahuva nuts can use to make oil for cooking and also they use to make soap to add fragrance. Mahuva nuts are very benefits for our health it is use diabetes, asthma, skin diseases, blood diseases, etc. In our **GIAN summer school** project we had go to field visit **GALIBIL & SINALI (DIST.PANCHMAHAL).** In this village mahuva trees can grow. We had seen their problems that they use stones to crack the mahuva nuts after cracking they shell out from the seed, But the main propose of our project is that the villagers was crack the nuts with the stones

and handle the nuts with their hand. During operation they may be have hand injuries in hands and also we had experience same problem while cracking.

BRAINSTROMING

In our research we had studies and make a mind map. In mind mapping we had make 2 steps. In this steps we had make all types of mind mapping and also make our final prototype.

1st step

- Gather the mahuva seed.
- Measure the size of all small and big seeds
- Gather all the information of mahuva seed cracking .operation which they recently doing.
- Measure the timing of seed cracking operation (COUNT FOR 1 MINUIT) .
- After processing how it will useful

2nd step

- Design the nut cracking equipment
- Choose the material which they use easily and get from surrounding easily .
- Take proper advise of villagers
- Make proper shape and size of material.

FIELD VISIT

In our field visit we had go to **galibili village and sinali village (Dist. Panchmahal).** This two village is whole of tribal area all the villagers are main occupation is farming. In the field visit we had seen that many women's of this village is crack the mahuva nuts with their hands, we also experience same kinds of this operation. In this operation we had notice that there was a chance of hand injuries because they crack the nut with stones and the nuts can handle with their hands. Its is a serious problems of hand injuries and the time consuming is also more

After 1st visit we had go to second village **saniyala (Dist.panchmahal)** in this village we meet all villagers they also doing same kinds of operation with their hands, but in this visit we had seen that the nuts not only with stones but also crack with hammer and some heavy equipment. After this operation they dry the seeds in heat and then they steam with the help of vessels. After the

steaming they press with the wooden punching device and they take out cooking oil from that seeds

RE-BRAIBSTROMING ON SELECTION OF PROBLEM STATEMENT.

After field visit we had research the problems that if we will made low cost device then it will very helpful to villagers and then we had design several equipment that they use in future. We had made and design several types of devices.

There are many kinds of design we had made, the name of equipment are mention below:-
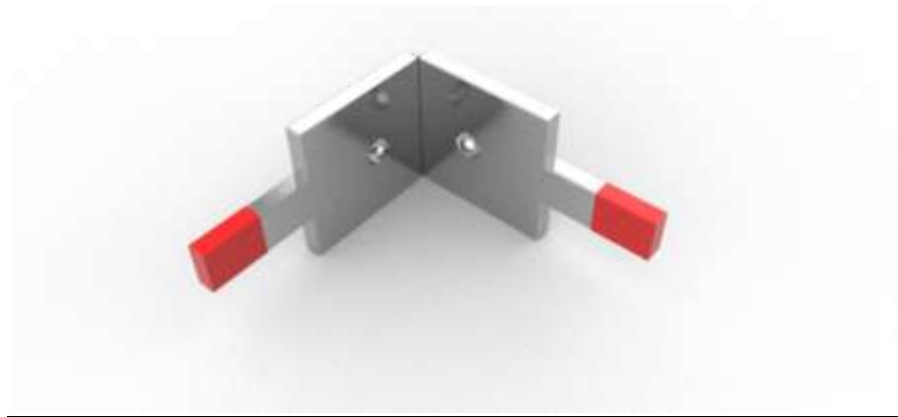
1. **Nut holding device with the help of spring mechanism**
2. **Single hole nut cracking device**
3. **Multiple hole nut cracking device**
4. **Single hole nut slizing device with the help of blade**

FINALIZING PROBLEM DEFINANTION AND PRIOR ART SEARCH

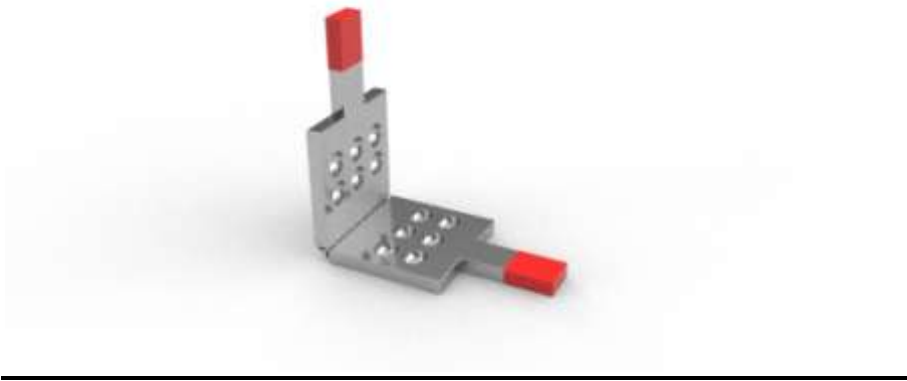## 1 . NUT HOLDING DEVICE WITH THE HELP OF SPRING MECHANISM

In this device we had search that with the help of spring mechanism will made nut holding device with stainless still material and also we fit the screw to hold the device. But there is a main problem is that the mechanism cannot work properly and cannot afford by villagers and also same problem of time consuming for villagers. We also estimate the cost of this device but it can reach to more than 1000/- rupees so we had postponed this idea.

2. SINGLE HOLE NUT CRACKING DEVICE

We also research 2nd solution in this solution we had design the wooden device in this device there is 2 main holes each hole is in opposite side, in hole we hold the nut and press with the handle and crack the nuts of bottom side. But there is a problem is happen that the nuts cannot break properly and also the cannot press with good efficiency also the nuts was break half and it also have time consuming operation so we had postponed this idea.

3. MULTIPLE HOLE NUT CRACKING DEVICE

In this device the content was quiet same as 2nd research but it had a 6 holes in single surface and there are having 6 nuts can crack in single operation, but the problem is having that load can be distribution can be happen. The 1st third hole can be crack easily, but 2nd three holes cannot have proper presser so they cannot crack properly.
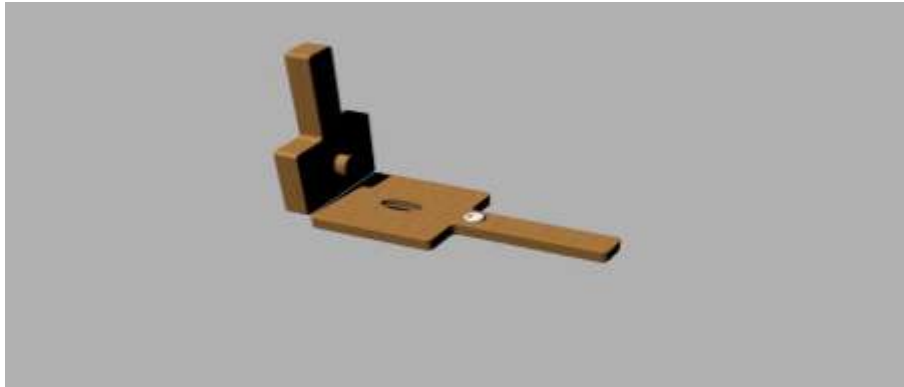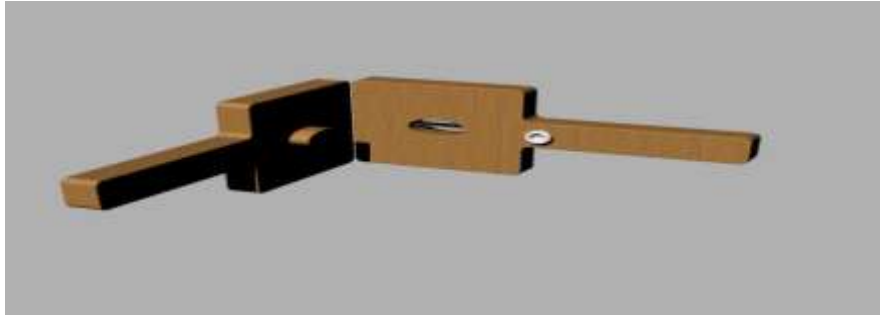
4 . SINGLE HOLE NUT SLIZING DEVICE

In this device we had research and also this device is our current device and also we can use in our experiment. This device we had use small blade and this blade is break the nuts in two parts. In this operation we had hold the nut on blade and press with bottom surface and on opposite side the embossing part can help to press breaks the nuts. But there is a problem that the nuts cannot crack properly but our team can solve the problem as soon as possible.

DRAWING OF CURRENTY PROTOTYPE

WORKING:-

The single hole nut cracking device it works with the help of blade the blade can cut the nuts and separate the shell. In this operation the nuts can hold up on the blade then after it should be press tightly with hands. After cracking the tow parts of nuts can be shell out and then further operation of oil extortion can be happen.

COMMENTS SUGGESTION BY USERS AND EXPERTS

After making our prototype project we had go again **GALIBILI AND SANIYALI VILLAGE (DIST.PANCHMAHAL)** we had give our prototype for testing to villagers. We meet villager's people and also we noted their suggestions and review.

:: EXPERTS SUGGETION::

1. **INDRAJITSIGH CHAVDA:-** He suggest that " keep blade in the hole and its blade put in horizontal shape and put some curve on inside of embossing part. "

2. **ARUSHI RANA:-** She said that "after cutting this operation make a pin to remove a seed shell. "

3. **UDAY AGARWAL:-** He suggest that " make a device that put more and more nuts in one bowl and chop in single operation.

PROTOTYPE IMAGES

USER TESTING AND FEEDBACK

1. **CHANDABEN (Committee member of rathava community) :-** "machinery is good and also operation is very easy for crack and it also reduces the time. But they also advice to made another product of shell out equipment."

2. **NAHAJUBEN (Resident of Galibili village) :-** they said that "first they break the nuts with the help of stones and there was more time consuming in this operation but after this device the operation was quiet easily and also have less time consuming"

3. **NAROT-FATHESIGHBHAI (resident of Saniyala village) :-** They said that " first we use traditional method to crack the nut and this method is have a chance of hand injuries, but after this device the problem can be solve of hand injuries."

4. **SUNDADIBEN (Resident of Galibili village) :-** They suggest that " all nuts have a different size and shape this machine is sufficient for small and medium size, but some mahuvda tree can grow in large size so you made special large hole equipment for this nuts"

5. **SURESHBHAI (Employer of Anandi organization) :-** they said that "in this machine only 1 nut can crack , but my suggestion is make multiple hole for fast operation."

6. **SAMIRBHAI (Resident of Saniyala village) :-** They said that " the product was very good and faster it is very useful in routine operation. the portion of blade can stick the nuts and cannot come out properly so make separate device of that."

7. **MADHUBEN (Resident of Saniyala village) :-** she said that " the product was to good and I am very happy of this product, but my suggestion is that improve some shell out operation on this device."