Case 7: Mahuda Oil Extractor

Team Members: Pallav Maru, keyur undavadiya, utsav malam, keyur kanjareeya

INTRODUCTION

The Mahua tree is a widely found tree in the central and northern part of India. Its flowers and fruits are used for various purposes. The flowers are used to produce alcohol and also used for their medicinal properties for getting relief from cough/cold and joint pain when used for massage. The seeds inside the fruit are used to extract oil, which is mainly used for cooking purposes.

CHARACTERISTICS

1) 35-40 ft. high.
2) 25-30 ft. in span.
3) Flowers harvested in the month of March.
4) Seeds mature in the period of May-June.
5) Flower is succulent in nature.
6) Used to make alcohol, cakes, juice.
7) Browns when dried.
8) Mahuda oil is also used as soap.

FIELD DESCRIPTION

Our team has visited two villages, first one we visited Aakli (panchmahal district) & second one we visited Gillibilli (Ratnagiri district). We visited there to see the mahuda seed processing. We have seen that the process was very time consuming & hard for people to making oil from seeds.

FIELD VISIT

Aakli - (near devgadh baria)

* First our team has visited Aakli village near devgadh baria. Were we stayed at surekha ben house who helps to meet different people who knows about mahuda seed process. At near about 9am first we can go to see mahuda tree, then we take some samples of seeds of mahuda then we meet Takhat sinh who was 70 yrs old, gives knowledge about mahuda seed process like grinding, steaming & squeezing.

* Falling of mahuda seed is mainly from March ending. He told us that first the mahauda seed fell down normally between 5-6 am. So they have to go early in the morning because mostly squirrels can eat that so they have to take it early. Then after take it home first they take off the layer/cover on seed manually, goats can eat these layers, and then they put these seeds to dry naturally.
Then after seed dried they can break it manually by using stones. Then after break the hard layer by stone mainly 2-3 seeds can get inside of it. Then they put it to dry naturally & then after it dries they can grinding it means they can make a powder form of these seeds after these steaming process can take place in which they put the powder form of seed in a plate & plate fully covers by cloth & they put it on the top of the pot, inside the pot the water
is filled, which can be heated by outside. & by steam of water the powder becomes smooth & easy to squeeze it & last they fill these steam powder into a cloth & they use an equipment to make oil from it, they called it chapdo. They tightly pack the powder in cloth & then they squeeze it by using chapdo. He said that after squeezing powder in last the powder remains is used as pesticides in farm.

* Then we met Bhopat bhai, they told us that they went to a shop to make oil of their seeds. They take their seeds & oil is directly taken from seed. He told that they got 15 liter oil from 35 kg of seeds. According to him it is easy, comfortable & affordable to them. He said that people cannot sell the oil they use it in their houses only.

* In last we visit the shop where we see the present equipment/machine which is used. M/c owner told that it is costly but it is like one time investment, because all peoples came their shop so they have beneficial.

**Gillibilli - (near godli)**

* Second we visited gillibilli village near godli. Suresh bhai can help us there, he first takes us on chanda ben house, we stay for some time & chanda ben also say about seed processing. & then chanda ben takes us on sonadi ben house, where the old method is used for taking oil. They saw us all equipment which are used in old method & how they use it. We also do practical of these processes.
* In first they take out seeds from the hardcover of seed. They use two rocks to break upper surface one they put horizontally & in one hand they hold the seed & by other hand they hammer it by stone & break it & take out the seeds from it.

* Then as a first process they grind it means they turn the seed into powder form. They do these process by using their leg they use simple instruments of wooden.

* Its mechanism is simple, the part of wood which can be fixed in middle & it oscillates at middle. On one end a person can oscillate it by leg & on the other side there was an extra wood piece is fixed at perpendicular to main plate which bottom is strikes with the seed’s & it makes the powder form.
Second process is to steam the powder form of seed. They used a base plate & fill it with powder of seed & tightly cover it with the cloth & then they put it on the pot which is filled with water & due to heating water steam generates & directly strikes with the base plate.

The last process is of squeezing the steamed seed powder. They used a simple wooden equipment for squeezing. They called it ‘chapdo’. Its weight is generally 5-7 kg & depends on the size of wood plates. Two wooden plates used in it, both plates one end is fixed & other end is free. End of both plates is fixed by thin steel wire. Then they put the cloth in which powder is filled. Now both free ends are pushed manually they used rope to push it & by
these they squeeze & oil can be taken from it. We all practically do these process manually. We try to feel the pain of their.

**OTHER USES OF MAHUDA SEEDS**

1) First of all the flowers of mahuda fall down. People can sell & eat it, birds can also eat it.

- Their problem is that the flowers can fall down on soil so, the particles of soil can sticks on the surface of flowers.

2) Goat & squirrel can eat the upper layer of the seeds.

3) In last the powder which remains after the squeezing process they used it as a pesticide in farm.

**MIND MAP**

From the reference of various processes of the oil making & from field visit, we decided the mind map shown below.
PROTOTYPE

1) FOR GRINDING PROCESS

* Our group will decide these design for a grinding process. We can convert rotary perpendicular to rotor, so we use bevel gears here one is connected with main shaft & other one is connected with the rotor. At upper end of rotor blades are fixed inside the wooden box, which can make the powder form of seeds. Here we can't fix the wooden box, the box is movable means after grinding we can take out the box & for doing process we can fix the box. The box is mounted on the base plate & the base plate is connected with the two columns. These columns carry the main shaft in which the shaft rotates. At both ends of shaft the paddles are fitted so, the person can cycling the paddles & the shaft rotates & rotor is rotates.
These is the sketch of the wooden box which upper part is open able so we can open the upper part & put seeds inside it than close it. & the wooden box is only clamped on plate so we can take it out or clamp it easily & the lower end of rotor male, female shaft is there for coupling. So it easily mounts & easily taken out.
These are the simple mechanism of our prototype. Two bevel gears, shaft, rotor & paddles are used in mechanism. First of all two columns are mounted on base, the main shaft is rotates between two columns & the paddles are connected on both ends of the shaft. & bevel gear is fixed in the middle of the shaft & other is at perpendicular to it. & rotor is fixed on the upper gear. Now the person is paddling so the shaft is rotates & by use of bevel gear the rotary motion is transfers to perpendicular rotor. On the upper part of rotor blades are fixed so the blades can rotates.

2) FOR SQUEEZING PROCESS

For squeezing /pressing process we decided these design. This process is so simple in construction & working .we can use two wooden rollers parallel to each other. Which can rotate manually by hand .we can edit paddles on the end to rotate it. Now we can make a bag of fiberglass cloth which is hard because it can pass from the rollers. Now we can fill it with the powder form of seeds after the steaming process. Now the bag will pass from the roller & the oil is taken out from it.

3) FOR SQUEEZING/PRESSING SEEDS

Another design for squeezing of seed powder is shown above which is done by our group. It is simple in mechanism & easy in making.

Five pieces of wood can be needed in it. One for column, second for base, third as a lever & fourth-fifth for press the powder of seeds. The one end of the lever is hinged &
another is free for applying pressure on it manually. Two horizontal wooden plates fixed perpendicular one to lever & other one is perpendicular to base. Both plates have the same taper angle. (Male-female wooden plate). Now we can put the bag of powder of seed between the taper parts of base plate. Now by applying force on the lever, lever press the bage & oil can make out of it. & due to tiny holes in the plate the oil is collected in vessel.

FINAL PROTOTYPE FOR PRESSING OF POWER OF SEED

* At last we finally decided the last design for pressing the powder. It is either made from wood or stainless steel.

* It's components are wood, lead screw, & container. The main part of these design is the lead screw which holds fully device. At the bottom part of the lead screw one taper angle wooden box is fixed & other wooden block is rotates on the axis of lead screw (male- female wooden block). There is a simple foundation is there on which the one block is fixed. Now by rotating the upper wooden block it can press the bag of the powder & due to holes in bottom block the oil is collected down.