



Get set go Here begins the real NEERA revolution

Sona John, CDB, Kochi - 11

No more frequent climbing of tappers, no sharp knives, no tying of bunches, nothing. Just climb the palm once, install the Saper on to the crown of the palm to the inflorescence and then the neera or toddy will reach the container installed on the ground through the pipeline attached to the Saper on the tree.

This innovative robotic Saper is designed and developed by Nava Design and Innovation Pvt Ltd. a Kochi based start up. A prototype of this equipment was displayed in the Hardtech Conclave held in Kochi during April 2019.

Shri. Charles Vijay Varghese, a young engineer based at Kochi is the inventor of this high tech Saper. If you install the machine in the crown of a coconut

The prototype of a robotic Saper to tap toddy and neera without climbing the palm every day is ready now. The prototype of the robotic Saper is designed and developed by Nava Design and Innovation Pvt Ltd. based at Kochi. The response being received for the Saper is quite encouraging. Even foreign companies are sending their people to Kochi to review the working of the Saper in person and then to place order.



palm attached to the inflorescence to be tapped, neera or toddy can be tapped and the details of the neera produced from the same will be received in the mobile phone of the farmer from time to time through the mobile application using Robotic Internet of Things.

This robotic tapping machine is the result of the fervent and tireless efforts of this team for more than one and a half year. This Saper lessens the effort of the tapper. The machine is doing the same job and can collect neera produced from one or two acres in a single collection point. Charles claims that the Saper has a life span of five years. During this period a tapper has to climb the tree for around 5400 times whereas when the Saper is installed the farmer has to climb the tree only 40 times which explicitly makes it clear that the burden of the tapper or the farmer is reduced drastically.

It was in 2015 while working in the Gulf that Charles came to know from media about the issues faced by the neera tapping sector. Even before that Charles had personally seen the constraints of the toddy tappers who used to tap toddy from the premises of his house in Kochi. The idea of designing a machine was there in his mind since then.

His engineering background as well as his inborn talent in drawing was the added advantages in developing the design of the machine. He remembers that he used to draw the sketch of the machine several times while he was in Gulf. It went on for more than four years and finally he decided

to quit his job and then to pursue his career with the machine. Eventhough the concept was not encouraged by people around him, but was not opposed. The application for the provisional patent for the Saper in the name of Nava Designs was filed in 2016 and was granted in 2017. Charles was a single army during those days and his team mates joined him when the idea was finally about to consummate. Charles, a graduate in Electrical and Electronics Engineering is the CEO of the company. His wife Ninu, his young engineer friends, Vinu, Sujith, Anup, Manu, supervisor Jithin and the tapper Sukumaran are his team members.

From the very beginning, the trials in designing the machine were done in the crown of a 40 feet high coconut palm in the backyard of Charles's house in Alwaye. A 40 feet high strong platform with scaffoldings was made initially with which all the six engineers could easily climb and stand on top. Sukumaran would also be there with the team from whom they learned about the nature of the crown, the character of the inflorescence and also on how to tap neera. Apart from Sukumaran, Bhaasi and Suresh also helped the team to equip themselves.

It was in 2017 July that he registered the start up in the Maker Village in KINFRA, Kochi and then filed the application for full patent. Both the Indian patent and international patents were received during the year. Further he has filed patent applications in another 12 coconut growing countries also.

The designing of the machine was started after



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a detailed study on coconut inflorescence and the proof of concept was completed in July 2018. The device has multiple mechanisms to mimic every action of a traditional tapper. The device is solar powered and has an in-built programmed controller to activate different mechanisms at specified time and the mobile application has all feedback and controls. A vacuum extractor at the ground level evacuates neera from the device and transfer it to a storage via drop line tubing connected to the device.

The proof of concept was designed and the initial trial was done in the coconut gardens in Govindapuram in Palakkadu district in Kerala which was a success. Now Charles is all set to rectify the minor drawbacks of the prototype in the final product and then will go for mass production. The team Nava Design and Innovation Pvt Ltd is planning the commercial production of the machine in a year's time.

Initially Charles had to struggle for the capital. The savings he made from his job was utilized and

a loan was taken from the bank. Kerala Start Up Mission and Bharath Petroleum also extended their helping hands. Charles gratefully acknowledges that this mission wouldn't have been successful without the help of all these agencies.

Charles claims that various trials have proved that the tapper productivity multiplies by minimum 72 folds with the use of his Saper. The same inflorescence can be tapped for a maximum period of three months or more since the adverse climatic conditions doesn't affect the functioning of the Saper.

Charles ensures that the equipment doesn't need any repair for a minimum period of five years. Only the blade and the Lithium Polymer (LiPo) battery need to be replaced. Once the commercial scale production of the Saper is started, the cost of the Saper can be limited between Rs. 7000 - 15000 or US\$ 100-200 says Charles.

Even though many favourable factors are there for the future prospects of the Saper, adversities like Excise laws for the neera production Licensing to the farmers may shadow his future prospects.

Charles, son of C A Vargese and Thankamani who hails from Alwaye in Kerala took his B tech from M Kumarasamy Engineering College in 2005 and PG in 3D Design from Chennai. Further to that he was working in Gulf for a decade and his last job was the Assistant Unit Manager at Khimji. He has a 6 month old daughter Natasha.

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