1. Design and Development of Battery Operated Cocoon Harvester for Silkworm Mountages (Bamboo Mountages)

Manual harvesting of cocoons from chandrike is labour-intensive and also a time-consuming process. To overcome this, the battery-operated cocoon harvester was developed to suit for one-man operation. Harvesting of cocoons from bamboo mountage takes around 30-35 minutes by manually, in case of developed battery operated cocoon harvester takes only 6 -7 minutes to harvest one bamboo mountage.The cost of operation of battery operated cocoon harvester was very less as compared to manual harvesting. The machine is also used for cleaning of bamboo mountage. The cost of cocoon harvester is approximately Rs.9, 000/- (Nine thousand rupees only).

2. Solid state cooling module for raw milk cooling

India is the leading producer and consumer of dairy products worldwide with 130 million ton annual milk production, yet a significant proportion is spoiled due to microorganism activity and lack of transportation facilities in rural areas of India. Proper cleaning and rapid cooling at 4°C or less temperature is essential to avoid spoilage. TEC or SSRS is an alternative for the conventional cooling systems. This technology works on the principle of Peltier effect which states that when voltage is applied between two ends of electrode, which is connected to semiconducting material creates the temperature difference which will cause material to diffuse from hot side to cold side. Thermoelectric solid state systems are compact, reliable, noiseless, flexible, eco-friendly and green technology. The present refrigeration system provides more cooling effect by using refrigerants but is has some disadvantages like emission of GHC's. Considering these demerits of conventional refrigerator system, the solid state refrigerator was designed and developed.

It is fabricated with food grade stainless steel material with 52 W/mK. The inner vessel (water jacket) has 3 litre capacity and outer cooling cabinet has 6.5 litre capacity, having 45 cm height and 15 cm diameter and the insulation has been provided to the unit with thickness the of l cm to reduce the heat loss to the surrounding. Components of solid state refrigerator include, Thermoelectric module/cooler, Extended fins with exhaust fan (heat sink)**,** Switch mode power supply

Outer and inner view solid state cooling module