**Technology Description**

Sequential toddy & nut production (SCTNP) technology which produces toddy and nuts from the same spathe of the palms has provided the farmers to increase farm income without sacrificing the copra products and fully maximize the economic potential of the palms with the addition of another product which is the coconut sap or toddy. It has high total sugar, ascorbic acid, phosphorus, and rich in amino acids, vitamins and minerals. It can be an alternative source of sugar and other products like sap drink (fresh cooled beverage), coco nectar (syrup) and sap vinegar which are high value food products.

**Tapping & harvesting of toddy**

Tapping is done twice a day. Harvesting of toddy can be done in morning (taken before 8 am) for the production of ‘tuba’ or vinegar while for the production of fresh sap drink, nectar and sugar, it is best to use the afternoon harvest (taken not later than 3 pm) which is sweeter than the morning harvest. To produce sweet toddy, it is necessary that all tools and containers to be used should be clean at all times. Adding of lime to the receptacle prevents the sap from fermentation.

**Toddy processing**

The conversion of toddy into sap drink, coco nectar and sugar involves a simple operation. As the coconut sap is highly perishable due to the yeast microflora, the harvested sap should be immediately processed by boiling for 1/2 hour in a large cast iron pan. This process prevents the sap from fermentation.

* Sap Drink

This can be simply done immediately by pasteurizing (heating at 60°C) the toddy. The toddy is then poured separately in the desired container tightly sealed and placed in the refrigerator. If hygienically prepared, the sap drink can be stored until 3 days without deterioration.

* Coco Sugar

Boil coco sap to evaporate the water under moderate heat with occasional stirring until liquid thickens at 115°C. Remove it from the flame when it begins to become very sticky. Continue mixing until it becomes granular. Air dry the brown sugar before placing them in a packaging material.

* Sap Natural/Organic Vinegar

Pour toddy in a wide large container with a clean netted cover to allow aeration and prevent entrance of dirt and foreign objects. After 5-10 days fermentation period in a well ventilated room., the sap can be harvested as vinegar. To maintain the desired quality of the matured vinegar (with at least 4% acidity), pasteurize it by boiling for 5-10 minutes at 60-65°C, allow the vinegar to cool before placing in very clean bottles and then cover tightly and sealed.
### EXPECTED INITIAL INCOME OF COCO SAP PRODUCTS (PhP)
*Per 30 trees per month production*

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Fresh sap</th>
<th>Vinegar</th>
<th>Syrup</th>
<th>Sap Drink</th>
<th>Granulated Brown Sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Est. harvest (30 trees)</td>
<td>60 li</td>
<td>60 li</td>
<td>60 li</td>
<td>60 li</td>
<td>60 li</td>
</tr>
<tr>
<td>% Recovery</td>
<td>100</td>
<td>80</td>
<td>17</td>
<td>70</td>
<td>15</td>
</tr>
<tr>
<td>Production – 30 trees</td>
<td>1,800 li</td>
<td>1,440</td>
<td>306</td>
<td>1,260</td>
<td>270 kg</td>
</tr>
<tr>
<td>Suggested Selling Price</td>
<td>5/10/100 ml</td>
<td>5/350 ml</td>
<td>P30/kilo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross Income</td>
<td>9,000</td>
<td>11,520</td>
<td>15,300</td>
<td>18,000</td>
<td>8,100</td>
</tr>
<tr>
<td>Material Cost</td>
<td>2,100</td>
<td>2,020</td>
<td>1,830</td>
<td>2,410</td>
<td>455</td>
</tr>
<tr>
<td>Processing Cost</td>
<td>-</td>
<td>337.5</td>
<td>1,350</td>
<td>775</td>
<td>1,687.5</td>
</tr>
<tr>
<td>Total Cost</td>
<td>2,100</td>
<td>2,357.5</td>
<td>3,180</td>
<td>3,185</td>
<td>2,142.5</td>
</tr>
<tr>
<td>Net Income</td>
<td>6,900</td>
<td>9,162.5</td>
<td>12,120</td>
<td>14,815</td>
<td>5,957.5</td>
</tr>
<tr>
<td>Return on Invest (%)</td>
<td>328</td>
<td>388</td>
<td>380</td>
<td>465</td>
<td>278</td>
</tr>
</tbody>
</table>

- Simple, practical, feasible and economically viable
- Compensating income can be derived due to diverse products
- Toddy products are organic and healthy foods
- New products that are less costly
- Promotes family labor

### FOR ADDITIONAL REFERENCES:
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- Ticsen, S.G., Sancha, L.V., Magat S.S. Sugar from Coconut Sap in Relation to Nut
  Production: A Review. Diliman, Quezon City: ARDB, 1997. 53p. (R&D Tech.1 Report No.4)

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