



Improved Tapping of Philippine *Canarium* Trees for Manila Elemi



by

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INTRODUCTION



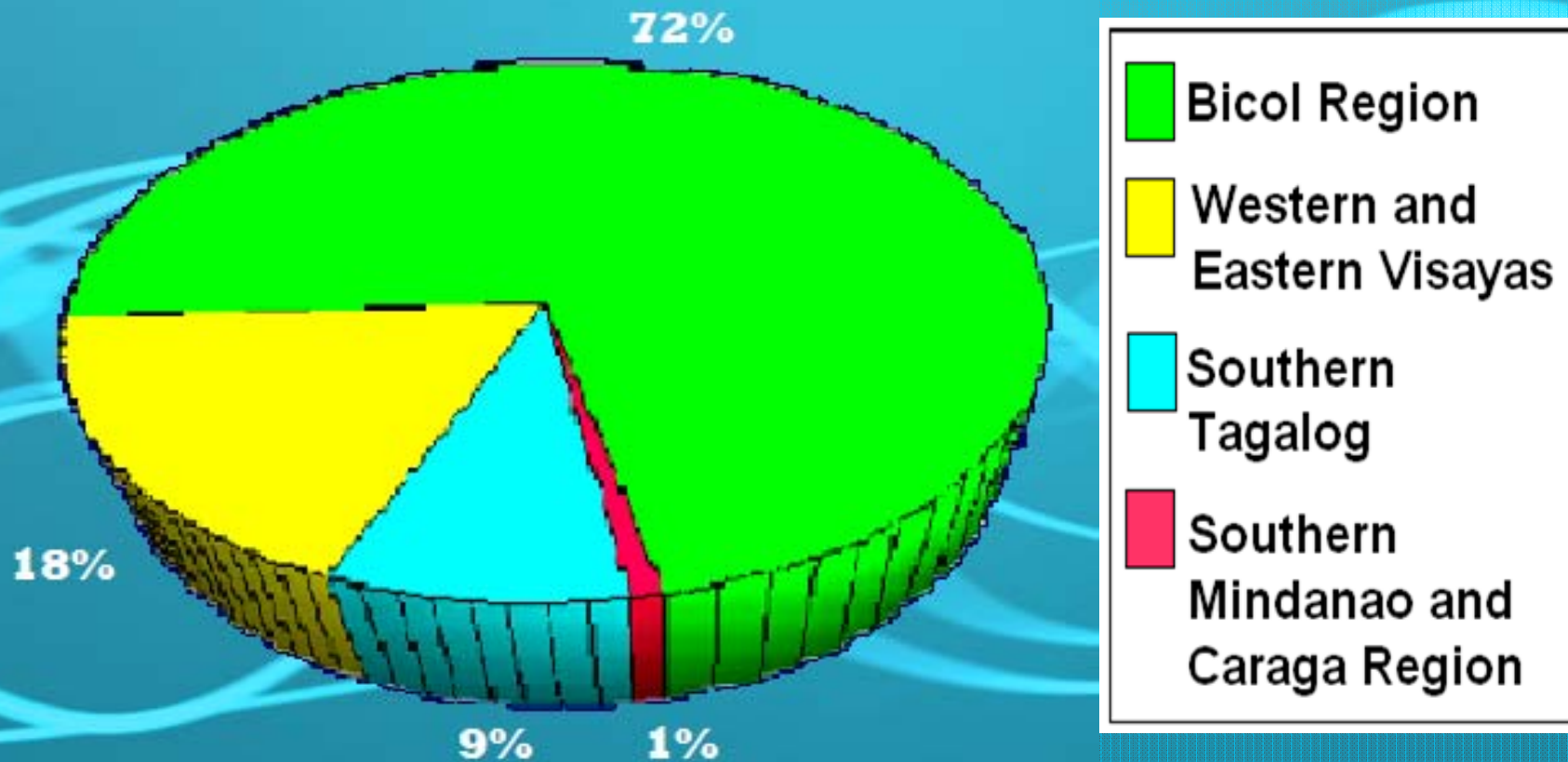


Distribution of *Canarium* Trees

| | |
|----------|--|
| Region 3 | Zambales (<i>Canarium asperum</i>) |
| Region 4 | Mindoro, Marinduque, Romblon (Sibuyan), Quezon Province |
| Region 5 | Camarines Norte, Camarines Sur, Albay, Sorsogon, Catanduanes, Masbate (including Burias and Ticao Islands) |
| Region 8 | Parts of Samar |

Distribution of Productive Pili trees

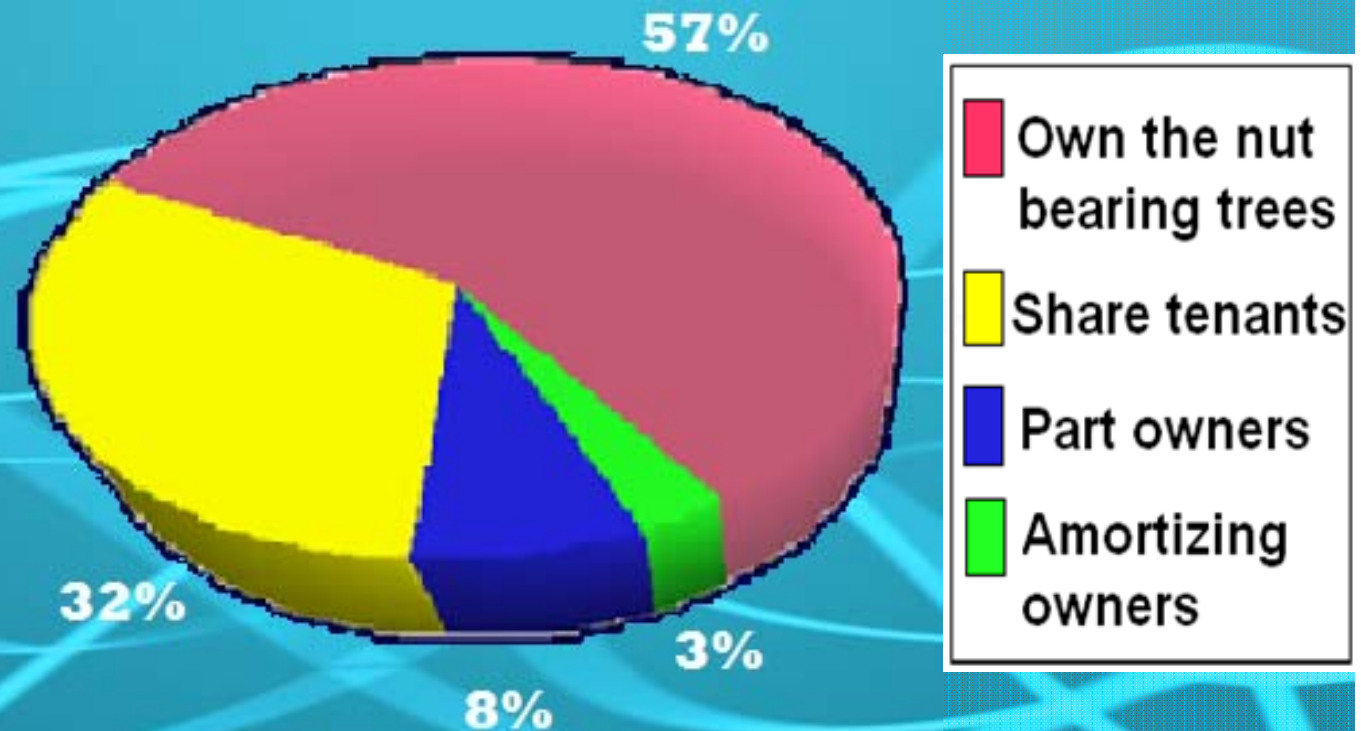
(BAS 2005)



Ownership of Pili trees in Bicol

(BCARRD Pili Benchmark Survey, 2000)

7,046.5 ha
total area
planted to pili
trees, with
221,250 trees
already
bearing nuts



Around 2,126 farmers own at least 10 nut-bearing Pili trees

Canarium species as an agroforestry crop



Widely adapted to various agroclimatic conditions
and wide range of soil types

Canarium species as an agroforestry crop

Pili can be grown year-round, either alone or intercropped with other crops, such as



Coconut



Banana

Canarium species as an agroforestry crop



Papaya



Pineapple

Canarium trees as source of Manila elemi resin



Sources of Manila elemi

- Pili (*Canarium ovatum* Engl.)
- Piling-liitan [*Canarium luzonicum* (Blume) Gray]
- Pagsahingin (*Canarium asperum* Benth.)



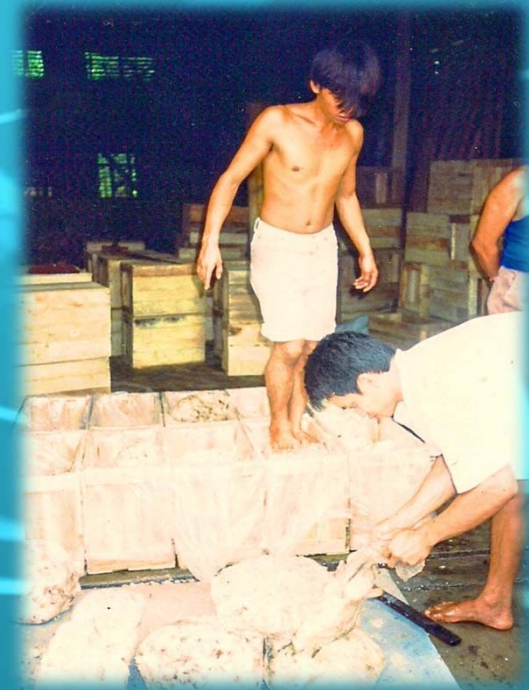
Chemical Composition of Manila Elemi

| | |
|---|--------------|
| Limonene | 56.0% |
| α - phellandrene | 17.6% |
| Elemol | 6.3% |
| Sabinene | 5.7% |
| Terpinolene | 2.8% |
| Elemicine | 2.4% |
| β- phellandrene | 3.3% |

Manila Elemi as dollar earner

The Philippine Forestry Statistics reported that in 2006, 180,550 kg. of *Canarium* resin valued at USD 298,052 was exported to :

France
Germany
India
Japan



Production and Export of *Canarium* Resin, 1997-2006

(Quantity in thousand kilograms, value in thousand US\$, FOB)

| Year | Quantity | Value |
|------|----------|-------|
| 2006 | 181 | 298 |
| 2005 | 165 | 237 |
| 2004 | 144 | 193 |
| 2003 | 361 | 528 |
| 2002 | 272 | 482 |
| 2001 | 246 | 528 |
| 2000 | 377 | 696 |
| 1999 | 245 | 464 |
| 1998 | 221 | 448 |
| 1997 | 162 | 436 |

Traditional Uses of Canarium Resin



In starting fires

Traditional Uses of Canarium Resin



Used for torches

Traditional Uses of Canarium Resin



As incense in religious ceremonies

Traditional Uses of Canarium Resin



Caulking material for boats

Industrial Uses of Canarium Resin



Components of oil and spirit varnishes and paints

Industrial Uses of Canarium Resin



Gives toughness and elasticity to pharmaceutical products such as plaster, lithographic works and perfumery

Industrial Uses of Canarium Resin

In making patent leather and sealing wax
Used in the manufacture of soaps, plastics,
printing ink, linoleum, shoe polish, floor
wax, etc.



Basic structure of the stem

Relevant to tapping



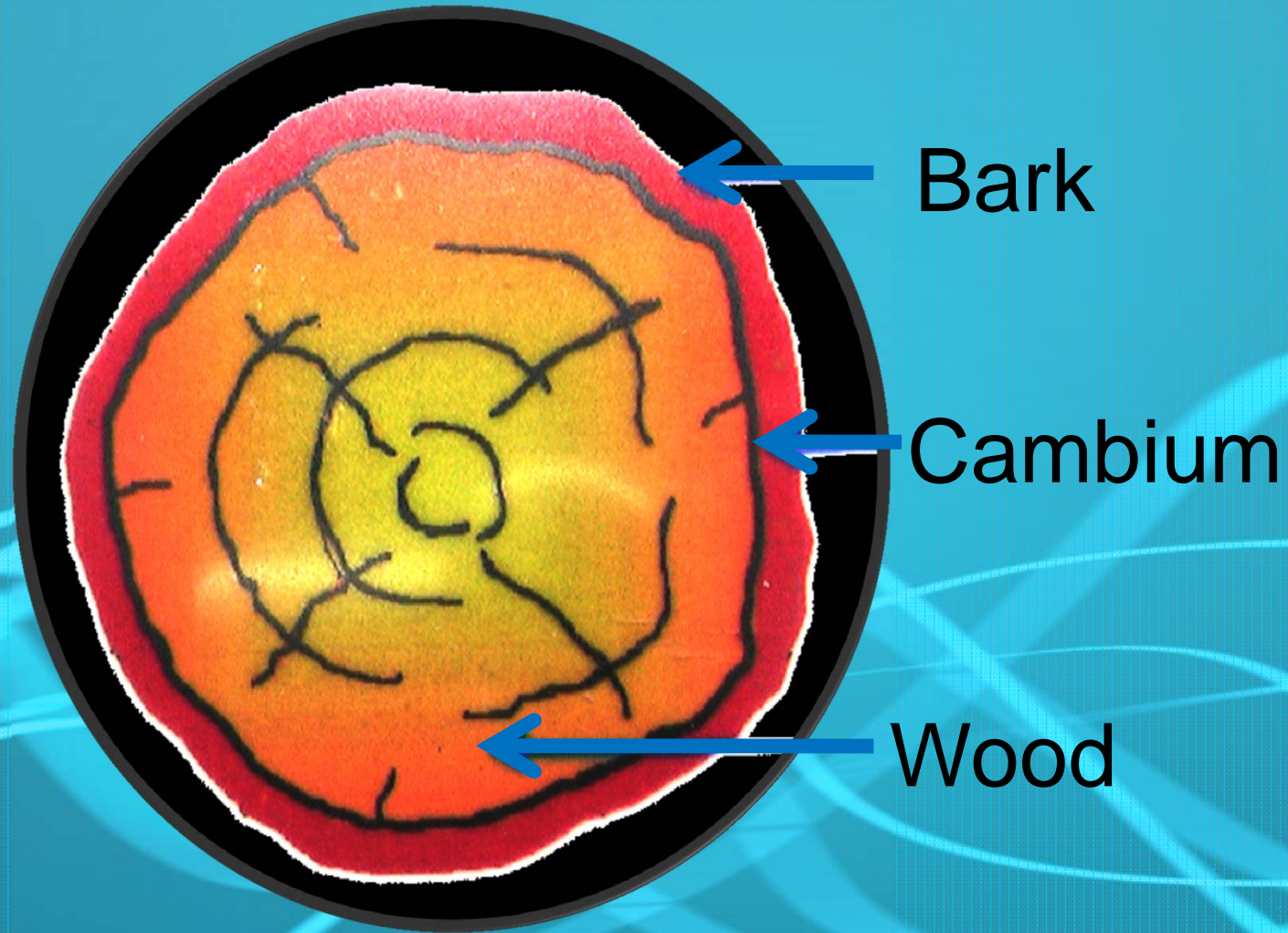


Fig. 1. Diagram showing three (3) major subdivisions of the cross section of the stem.

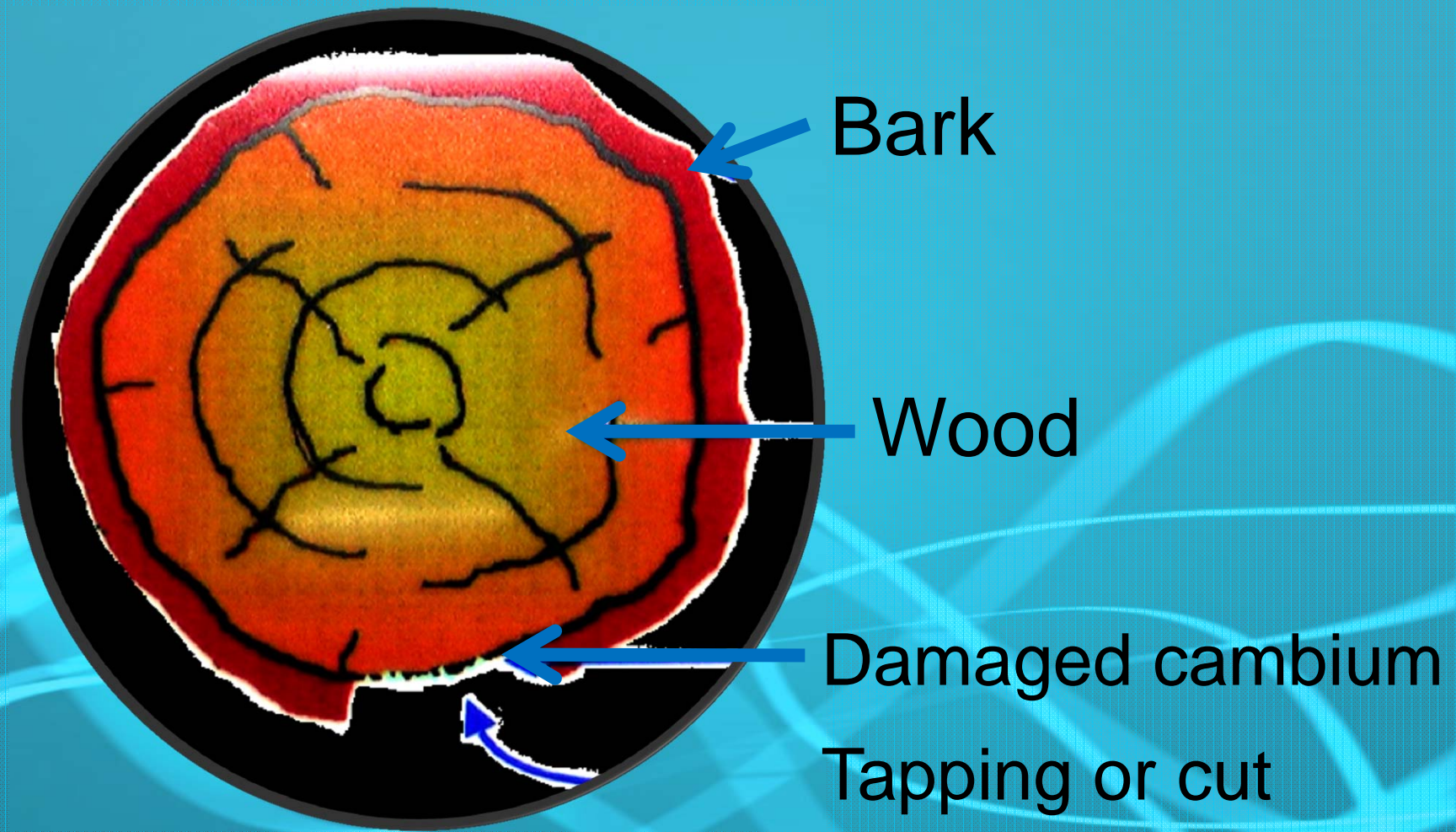


Fig. 2. Diagram showing cross section of the stem with damaged cambium resulting to slower healing process of the cut or wound.

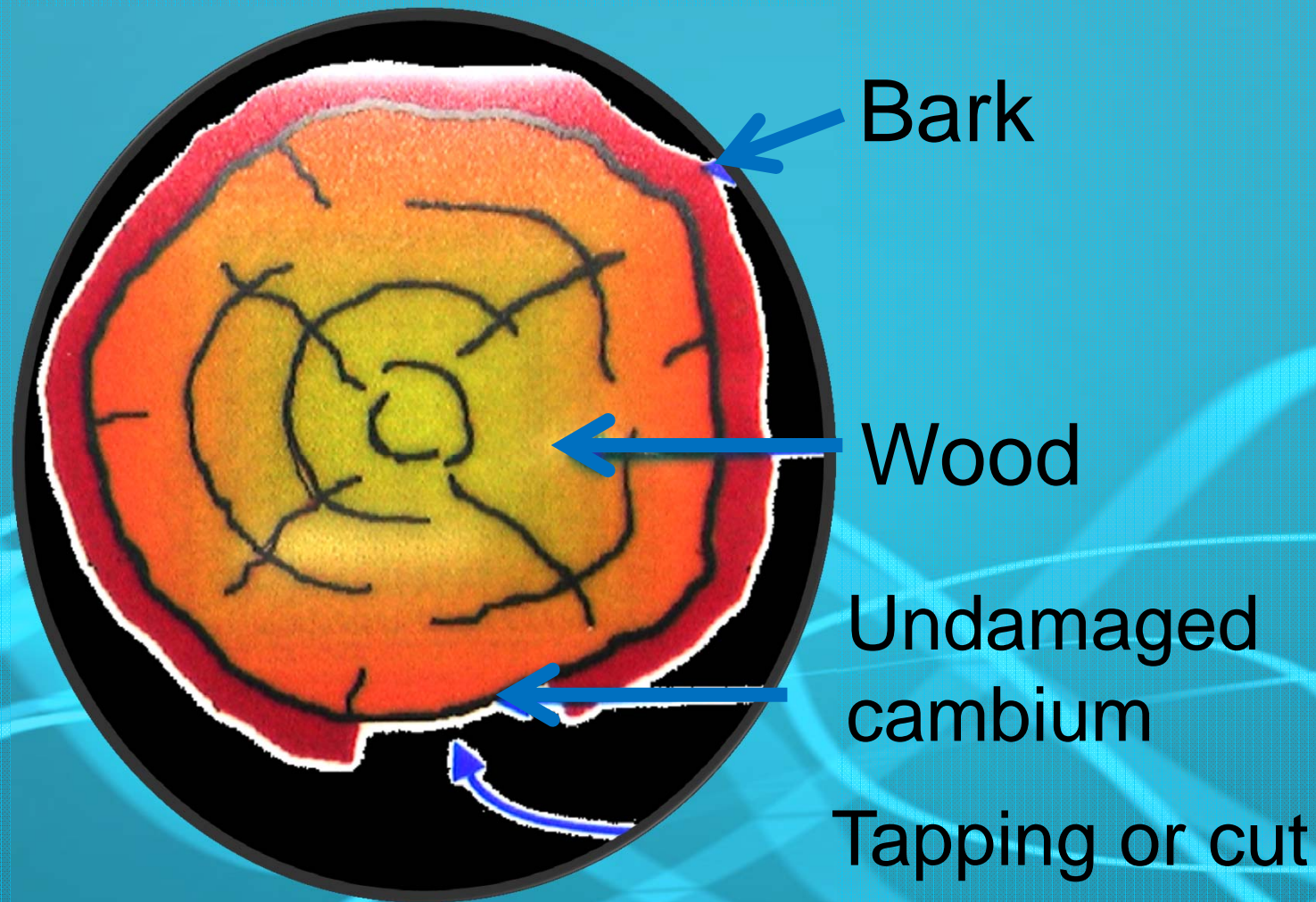


Fig. 3. Diagram showing cross section of the stem with undamaged cambium resulting to faster healing process of the cut or wound.

Factors Affecting Resin Production

- **Vigor of the tree**
- **Location**
- **Inherent Capacity/Hereditity**



Traditional Tapping Methods



Deep tapping



Overtapping



Frequent
rechipping

Tools and Accessories Required for Tapping

- **Bolo and knife**
- **Cup**
- **Nails**
- **Bark hack**
- **File or whelting store**
- **Bottle (plastic, for application of acid)**
- **Polyethylene plastic sheets**
- **Roofing cement**
- **Bucket**
- **Funnel (to transfer resin from bucket to drum)**

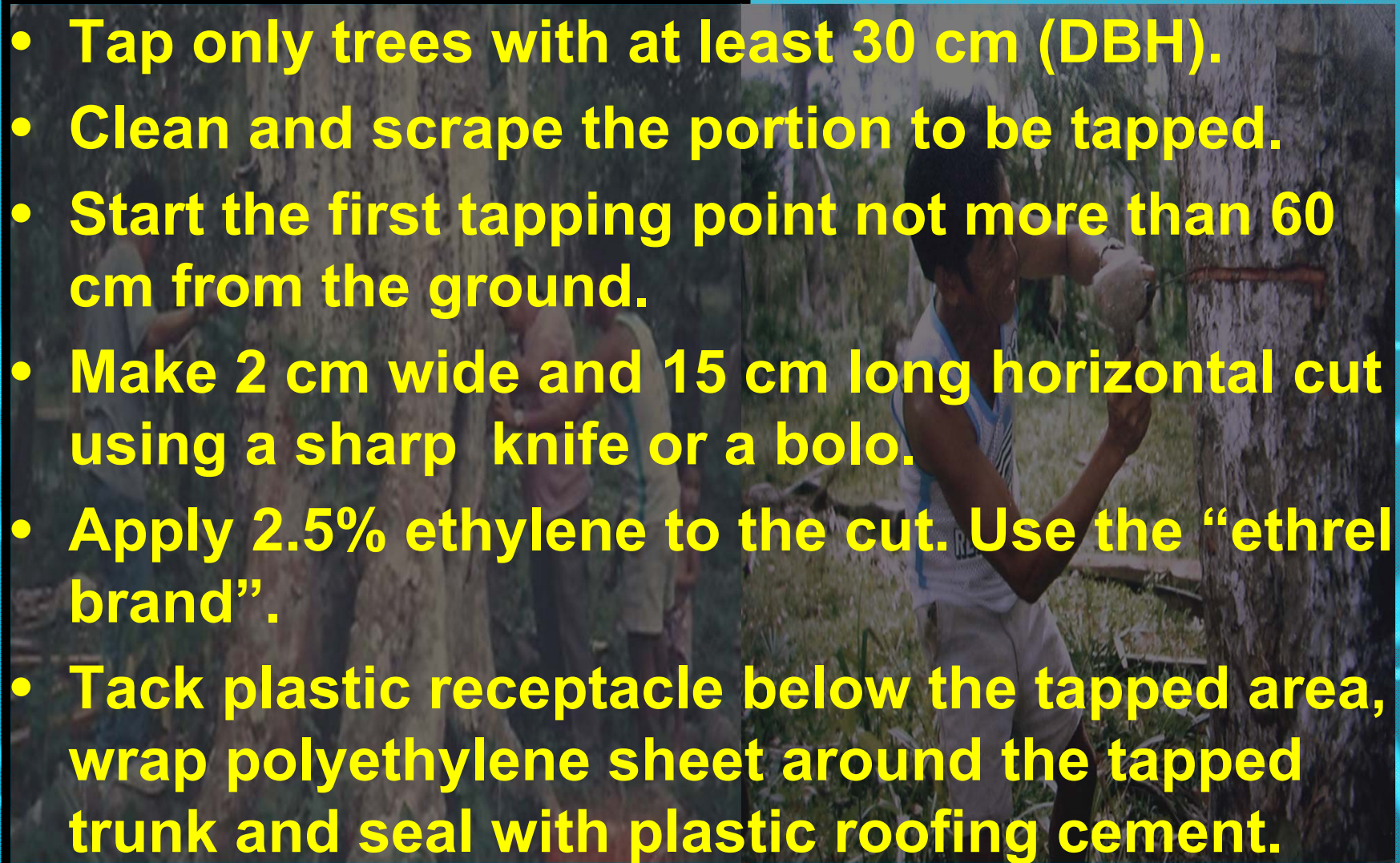


Tools and Accessories Required for Tapping

- Shaving tool
 - Guttering
 - Hammer
 - Sulfuric acid
 - Plastic bag as receptacle
 - Drum barrel
 - Jute sacks
 - Protective clothing and accessories (for tapper, including visor or goggles, acid-proof gloves, plastic apron or other garments and gum tools)
- 
- A photograph showing a group of people in a forest. In the foreground, a man wearing glasses and a white polo shirt is demonstrating a tapping process on a tree trunk. He is holding a branch of the tree. In the background, several other people are observing. The scene is outdoors with many trees and sunlight filtering through the canopy.

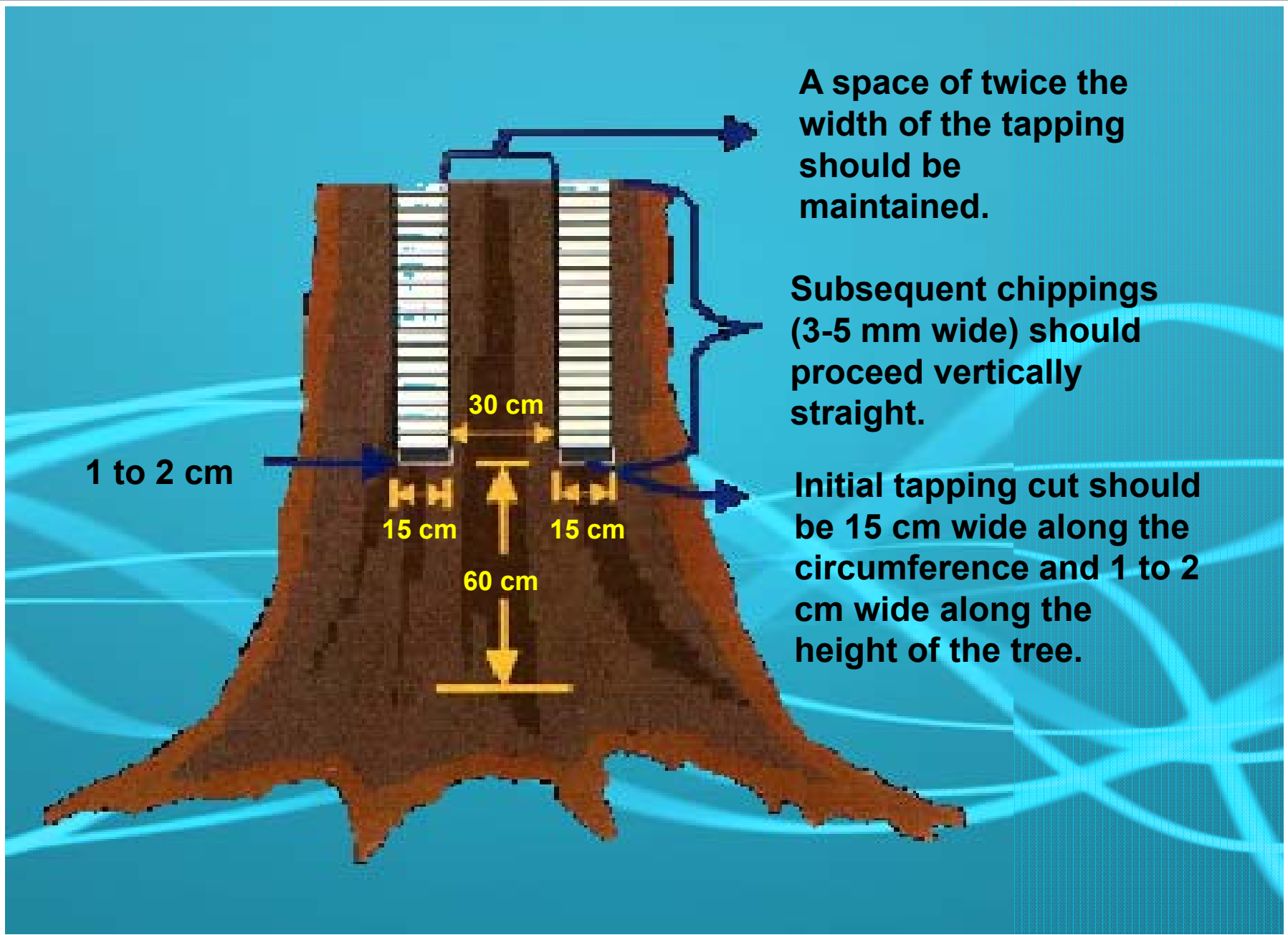
Proper Tapping Procedure

- Tap only trees with at least 30 cm (DBH).
- Clean and scrape the portion to be tapped.
- Start the first tapping point not more than 60 cm from the ground.
- Make 2 cm wide and 15 cm long horizontal cut using a sharp knife or a bolo.
- Apply 2.5% ethylene to the cut. Use the “ethrel brand”.
- Tack plastic receptacle below the tapped area, wrap polyethylene sheet around the tapped trunk and seal with plastic roofing cement.



Proper Tapping Procedure

- **Collect exudates after a week or when resin flow stops.**
- **When exudation stops, make a fresh cut (3 to 5 mm wide) immediately above the previous one.**
- **Tap vertically upward on the untapped portion of the trunk and use a ladder for convenience (tapping tools should be razor-sharp at all times to ensure clear cuts and care should be taken to obtain a clean product as much as possible).**



A space of twice the width of the tapping should be maintained.

Subsequent chippings (3-5 mm wide) should proceed vertically straight.

Initial tapping cut should be 15 cm wide along the circumference and 1 to 2 cm wide along the height of the tree.

1 to 2 cm

15 cm

15 cm

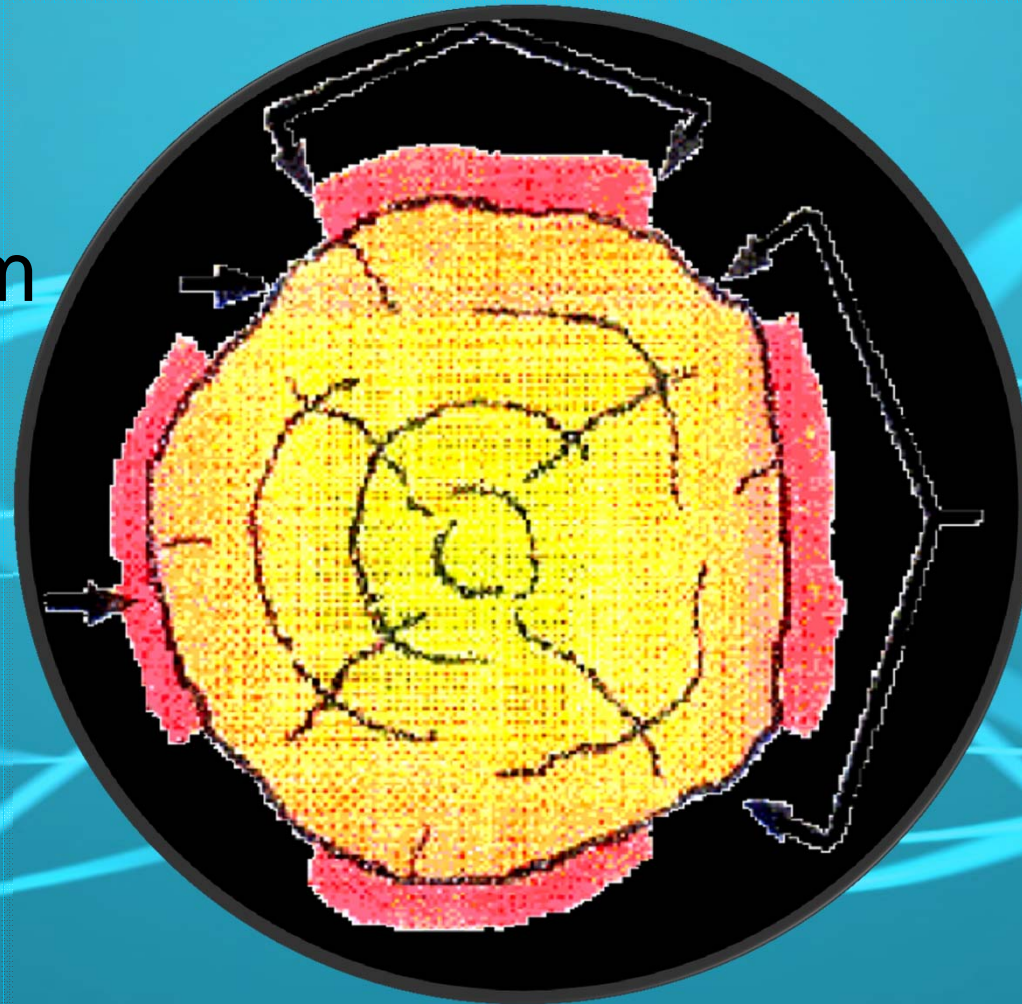
30 cm

60 cm

Untapped portion between tapping
twice the length of the tapping

Cambium

Bark

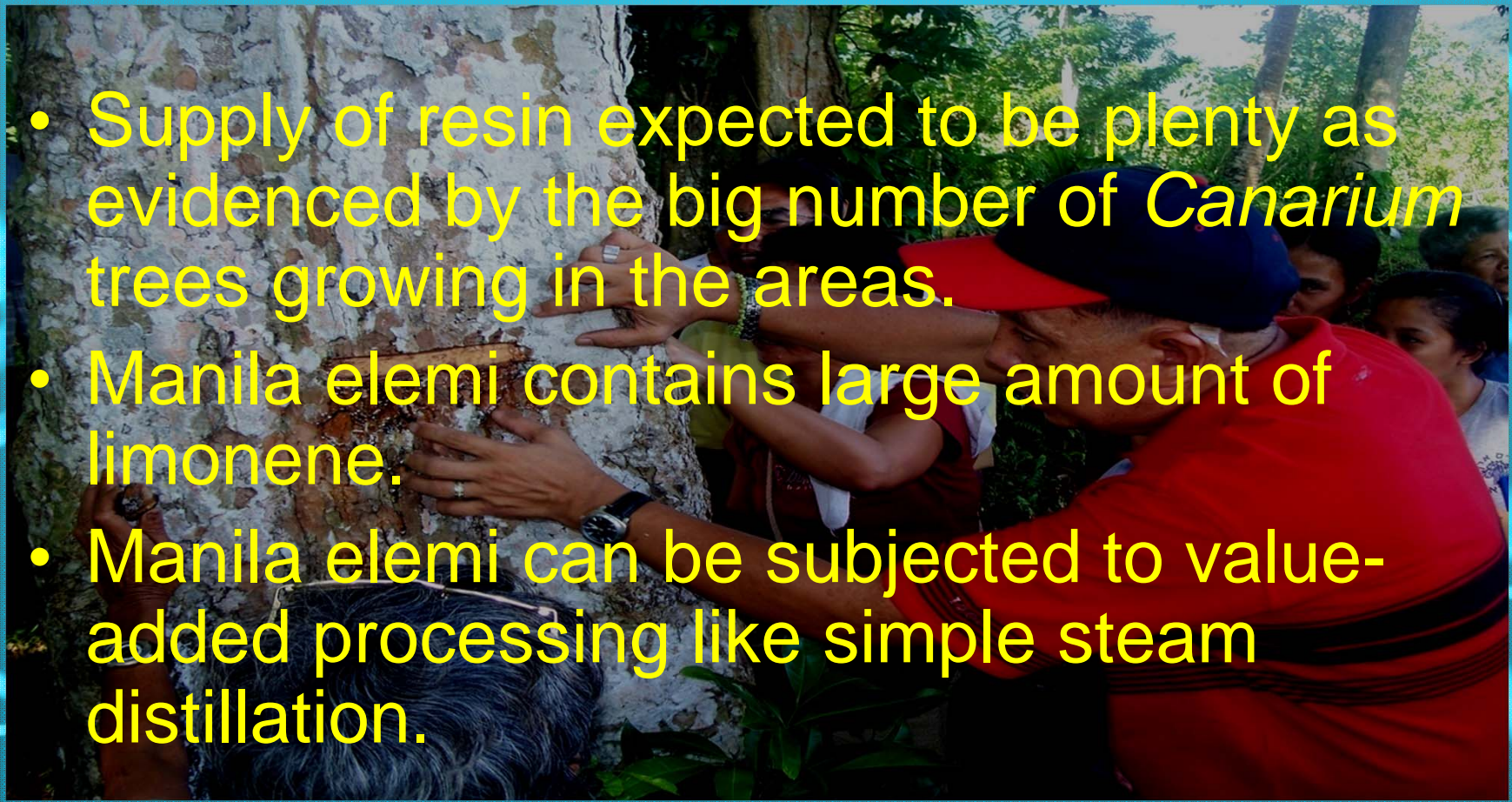


Tapping

SWOT Analysis of Tapping *Canarium* Trees

Strengths

- Supply of resin expected to be plenty as evidenced by the big number of *Canarium* trees growing in the areas.
- Manila elemi contains large amount of limonene.
- Manila elemi can be subjected to value-added processing like simple steam distillation.



SWOT Analysis of Tapping *Canarium* Trees

Strengths

- 
- Manila elemi commands much higher price than Almaciga resin.
 - Manila elemi has varied economic uses.
 - Potential of *Canarium* trees to thrive because of Bicol's ideal climate.

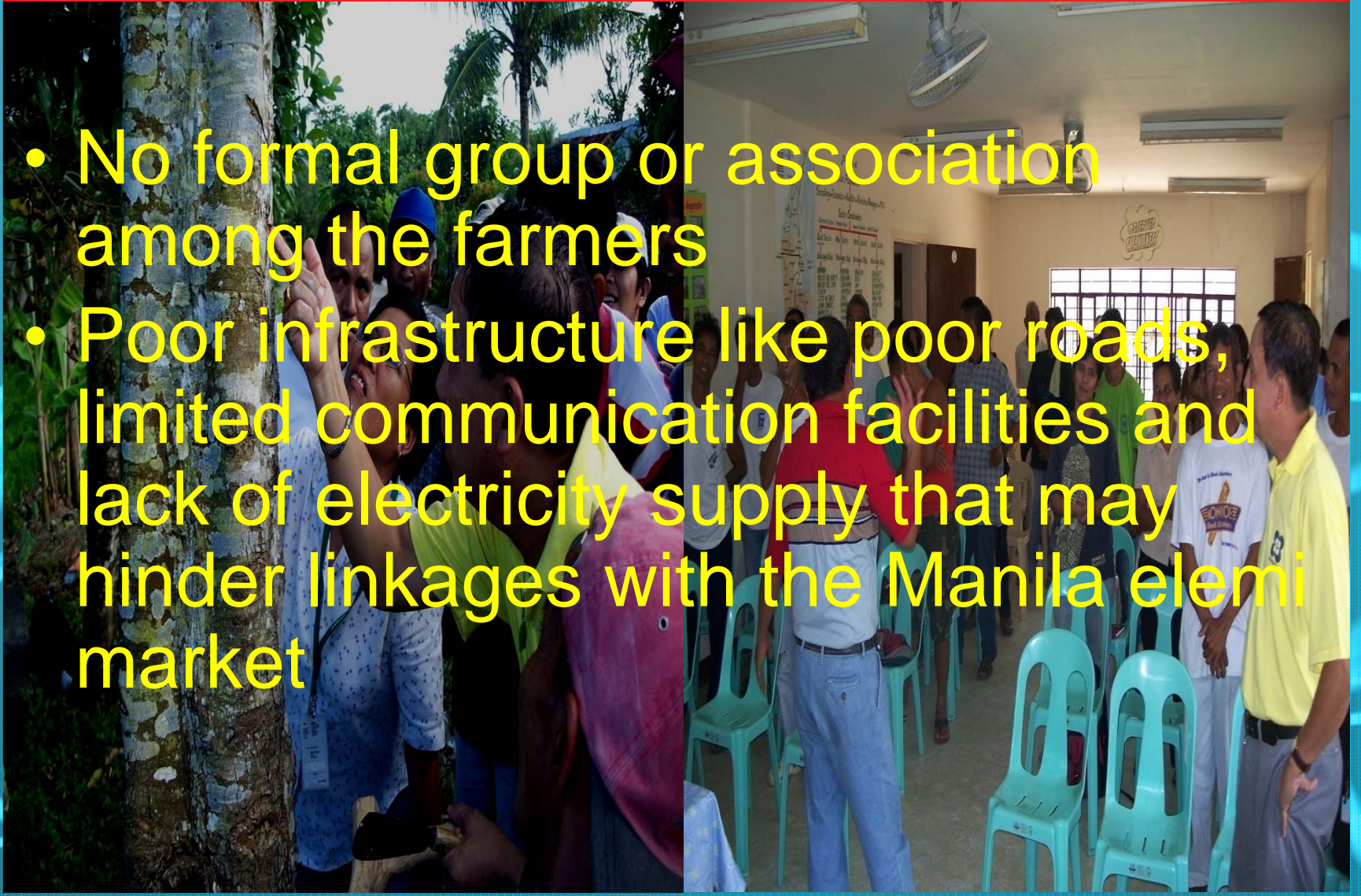
Weaknesses

- Irregular amount of resin yield
- No regular market
- Absence of knowledge on Manila elemi production and marketing
- No previous experience in Manila resin tapping among farmers



Weaknesses

- No formal group or association among the farmers
- Poor infrastructure like poor roads, limited communication facilities and lack of electricity supply that may hinder linkages with the Manila elemi market



Opportunities

- There is an opportunity to start varnish production in the region
- An opportunity also exists to open the region as the center for Manila elemi production
- Improved tapping technique for Manila elemi resin has already been developed by FPRDI



Threats

- Over tapping may lead to destruction of *Canarium* trees
- The possibility of constructing of trails and dirt roads leading to the *Canarium* tree plantations may open the areas to unscrupulous middlemen



Threats



- Competition with synthetic resin and presence of other substitutes
- Demand-driven not supply-driven market
- Occurrence of drastic weather conditions

Cost and Return Analysis

Information on *Canarium* Resin tapping in Quezon Province

| Items | Alabat | Bondoc Peninsula |
|-------------------------|-----------|------------------|
| No. of trees tapped/day | 19 | 15 |
| No. of cuts made/tree | 7 | 5 |
| Harvest Cycle | 15 days | 15 days |
| Cutting Cycle | Daily | Daily |
| Yield/tree/harvest | 5 kg | 3 kg |
| Harvest/month | | |
| Summer | 40 kg | 35 kg |
| Average resin | P32.00/kg | P31.00/kg |
| Sale of resin per month | P1,120.00 | P1,085.00 |

Conclusion

Tapping Philippine resins is a veritable economic activity among farmers. Applying the proper or scientific tapping techniques offer the following advantages:

- prolongs life of the tree
- increases production of quality resin
- increases income of tappers and government
- is environment friendly and helps in the conservation program of the government

Conclusion

- preventing the premature death of *Canarium* trees can help alleviate global climate change brought about by the increasing level of carbon dioxide (CO_2) in the atmosphere
- trees sequester (CO_2) from the atmosphere and the longer the *Canarium* stands are preserved in the forest, the better they can contribute in the global effort to remedy climate change



Thank you!

