



Workshop “Climate Change and Natural Rubber Systems”

*Impact of Climate Change on
Latex Harvesting*

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OBJECTIVES

- **Sharing some information based on field observations and experience on the impact of climate change on latex harvesting activities and rubber yield.**
- **Provide some practical solutions on how to deal and cope with the issues and problems faced by rubber tappers and plantation owners.**

CLIMATE CHANGE ISSUES AFFECTING LATEX HARVESTING

- **Intensity and amount of rainfall**
- **Time of rainfall**
- **Duration of rainfall**

LATEX HARVESTING OPERATIONS AFFECTED BY CLIMATE CHANGE ISSUES

- **Time for commencement of tapping**
- **Latex dripping time**
- **Partial loss or total crop loss due to unexpected rain during or after tapping operation has completed**
- **Latex collection time**
- **Total number of tapping days**
- **Stimulant application – time and frequency**

EFFECT OF DISRUPTIONS ON ROUTINE LATEX HARVESTING OPERATIONS DUE TO CLIMATE CHANGE

- **Delay in commencement of tapping time due to occurrence of abnormal and unpredicted rainfall.**
- **Delayed latex collection time past mid-day when tapping commenced late.**
- **Shorter latex dripping time when tapping commenced late.**
- **Frequent partial or total crop loss when unexpected rain falls while tapping is still in progress or latex are still dripping into the cups.**
- **Reduction in the total number of normal tapping days due to rain interruptions.**

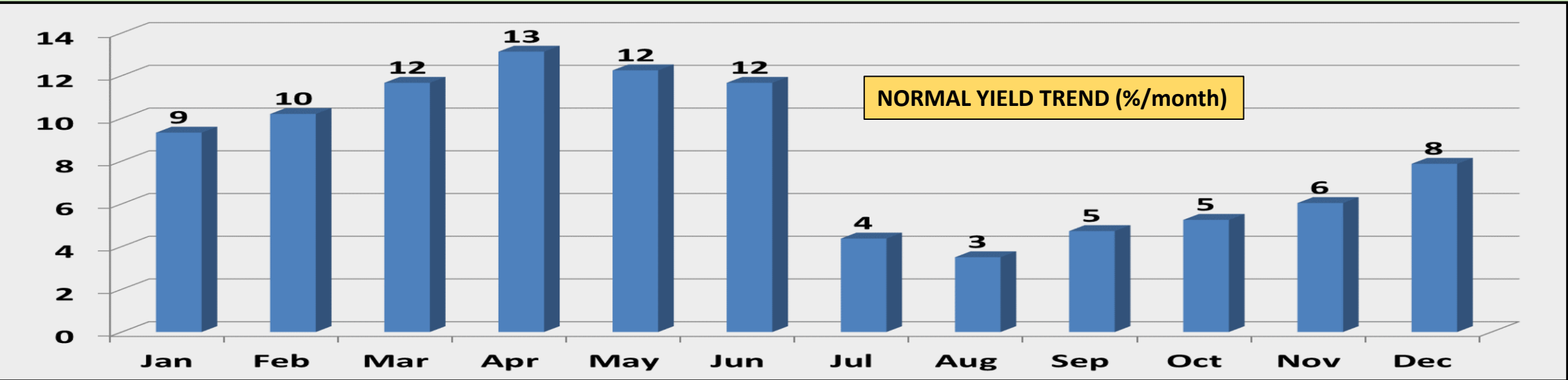
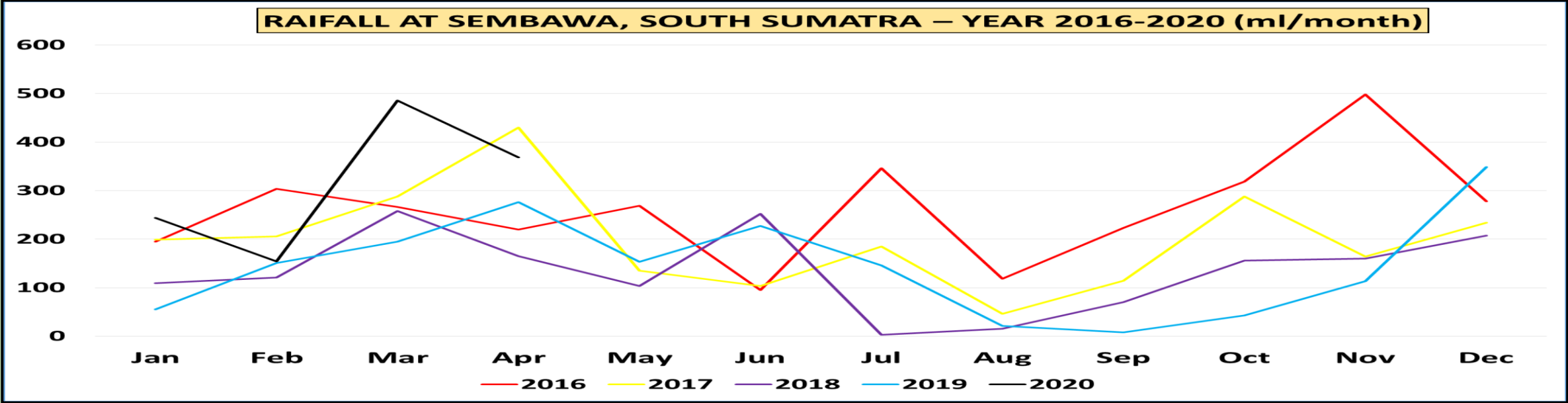
DISRUPTION TO TAPPING ACTIVITIES BY ABNORMAL RAINFALL

- **Ideal time for rubber tapping to achieve good yield under normal climatic conditions in most countries is after 10.00 pm till around 9.00 am on the following morning.**
- **However, due to personal safety and practical reasons, most tapping operations including latex collection are carried out between 4.00 am till 11.00 am.**
- **In the past, tappers are able to set quite a standard and routine time for tapping. At present this is no longer possible.**
- **During the past few years, tapping operations are often disrupted by unexpected early morning showers causing partial or total loss of crop.**
- **Tappers had to adjust their tapping and latex collection time to avoid or reduce crop loss due to sudden showers which are impossible to predict.**

**OUTBREAK OF LEAF DISEASE CAUSING SERIOUS
SECONDARY LEAF FALL TRIGGERED BY CLIMATE CHANGE**

- **In early 2018, Indonesia and Malaysia experienced severe secondary leaf fall due to fungus attack on rubber leaves by *Oidium*, *Colletotrichum* and *Pestalotiopsis* resulting from increased rainfall causing significant reduction in canopy density and unhealthy leaves and subsequently reduction of rubber yield.**
- **Subsequently in 2019 and 2020, India, Thailand and Sri Lanka also suffered similar bad experience.**
- **To-date, the total area affected by the secondary leaf fall in the 5 NR producing countries is around 400,000 ha.**

RAINFALL AND NORMAL YIELD TREND IN SOUTH SUMATRA



*SLIDE ON RUBBER YIELD
TO BE ADDED*

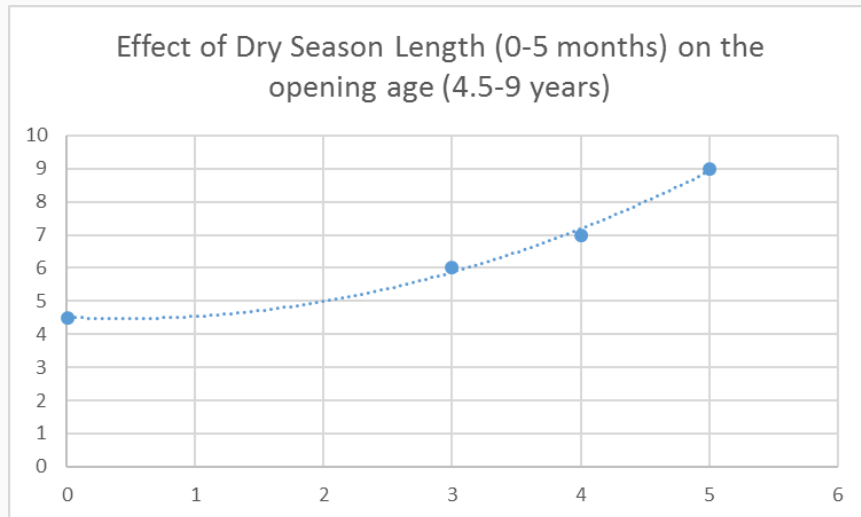
*PHOTOS ON SECONDARY LEAF FALL
TO BE ADDED*

CLIMATE CHANGE ISSUES AFFECTING LATEX HARVESTING

- **Lengthened dry seasons combined with higher temperatures.**
- **Increased contrast between seasons (rainy/dry)**

CLIMATE CHANGE ISSUES AFFECTING LATEX HARVESTING

- **Lengthened dry seasons combined with higher temperatures, increased contrast between seasons (rainy/dry), will result in a decrease in growth during immature period, and therefore in a delayed opening time**
- **Reduced economic efficiency, delayed return on investment**



Opening norm :
50 cm at 1m from the ground
45 cm at 1.5m from the ground

CLIMATE CHANGE ISSUES AFFECTING LATEX HARVESTING

- **The latex is a cytoplasm composed of about 60% of water. Any factor limiting the water uptake (decrease in rainfall, drought, increased temperature resulting in a break of leaf transpiration...) by the tree will have direct depressive effect on the latex yield.**
- **Any water deficit will immediately result in a drop in latex regeneration capability (combined with increasing temperature and VPD, leaves stomata closure will result in a blockage of all water transports).**
- **Strong and negative interaction with efficiency of stimulation in case of reduced tapping frequencies**

CLIMATE CHANGE ISSUES AFFECTING LATEX HARVESTING

- **Adaptation :**
 - **The annual tapping stop during wintering and dry months should be lengthened when the dry season length and severity are increased**
 - **From 2-3 weeks recommended under normal conditions (refoliation time) up to 3 months recommended in extreme cases (ex : Esan)**
 - **Reduction of intervals between stimulations in case of reduced tapping frequencies**

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Effects of Different Tapping Rest Periods during Wintering and Summer Months on Dry Rubber Yield of Hevea Brasiliensis in Thailand

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CLIMATE CHANGE ISSUES AFFECTING LATEX HARVESTING

- **Effect of global warming :**
 - Latex flow after tapping (duration of flow especially) is linked to the internal turgor pressure of the latex vessels
 - This is the reason why all rubber planters tap at night or in the early morning, when the daily temperature is the lowest and latex turgor pressure is the highest (negative relation $T^{\circ}\text{C}$ /turgor).
- **What will happen if the temperature raises by 2 or 3°C at the time of tapping ?**
 - Effect of those coming high temperatures on yield are unknown as rubber tree has never been planted/tapped in areas where mean annual temperatures are above 28°...
 - But nothing good *a priori* : Urgent need of research for adaptation

Thank you very much for your attention

