SEEDBALLS

Exploring Its Potential For Alternative Planting Strategies In Elevating Forest Landscape Restoration Effort For Sarawak, Malaysia

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SARAWAK MERDEKA 60 TAHUN
SARAWAK MAJU MAKMUR
1963 - 2023

TABLE OF CONTENT

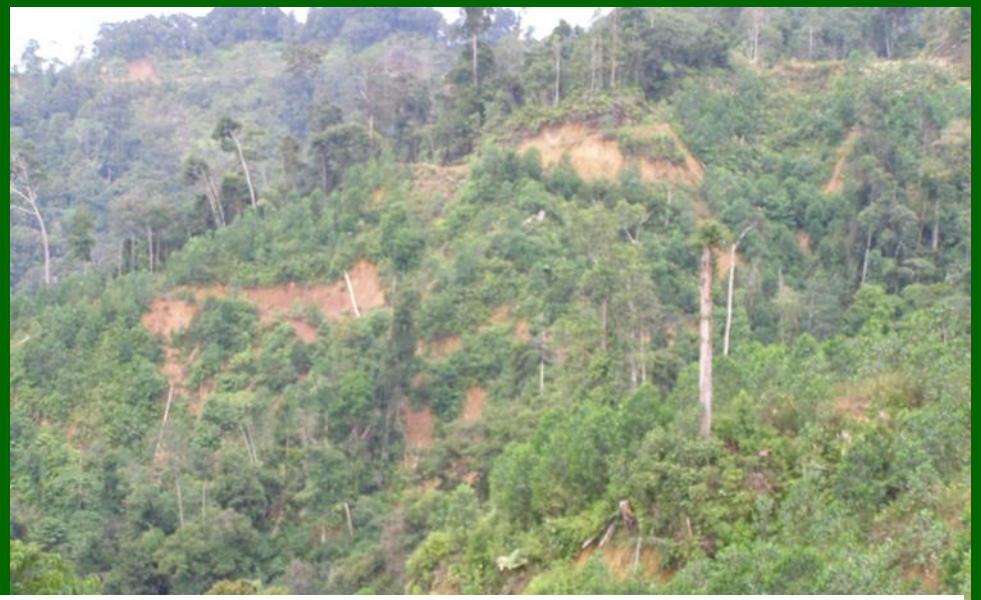
INTRODUCTION

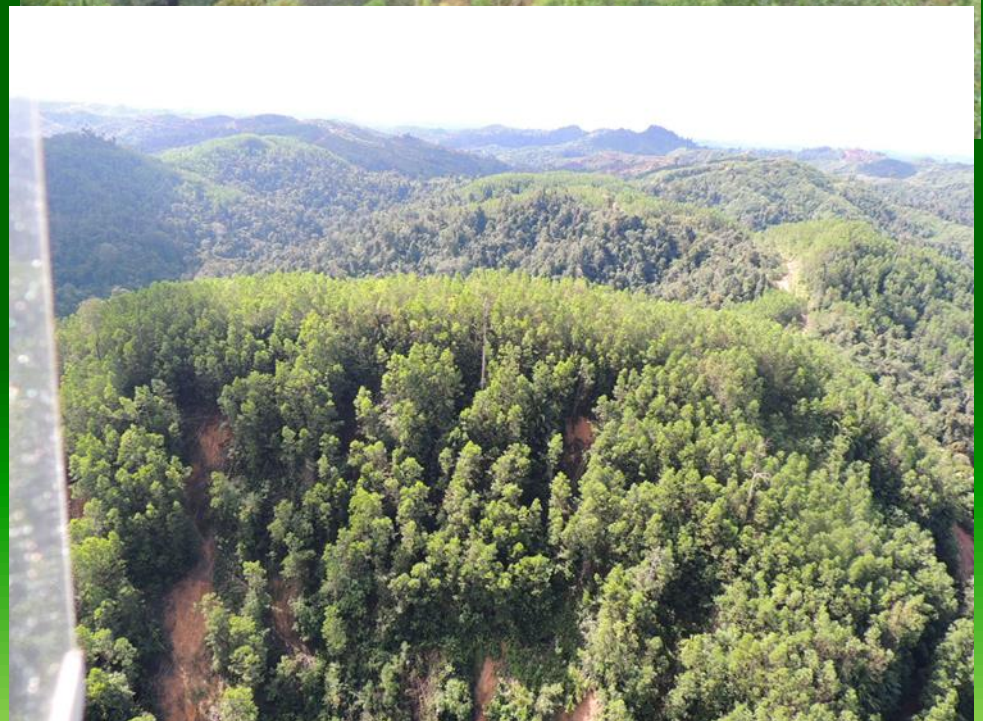
FOREST LANDSCAPE RESTORATION SARAWAK GOVERNMENT COMMITMENT

OBJECTIVES OF FLR IN SARAWAK

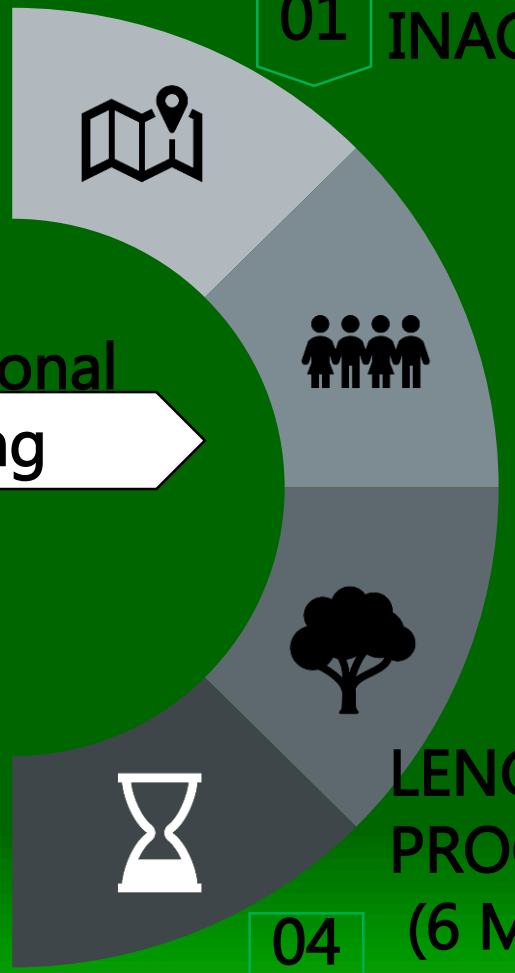
1. To enrich logged-over areas with high-value timber species
2. To restore and conserve degraded forests especially in Permanent Forest Estate and State Land Forests
3. To alleviate livelihood of forest-dependent communities
4. To reduce pressure on natural forests by shifting timber production towards plantations of fast-growing species

CHALLENGES OF FLR





Conventional Planting



01 REMOTE AND INACCESSIBLE AREAS

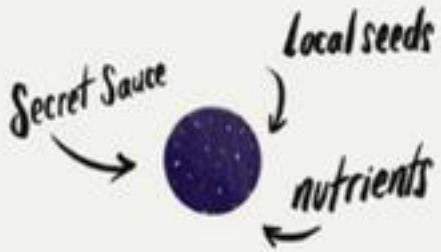
02 LABOUR INTENSIVE, REQUIRED SPECIAL KNOWLEDGE & EXPERIENCE

03 DIFFICULT TO SOURCE FOR SEEDLINGS

04 LENGTHY PLANTING PROCESS (6 MONTHS RAISING SEEDLINGS)

ALTERNATIVE SOLUTION

How it Works



1. Create nutrient-packed pods

2. Fire pods into the earth
(1 pod / second)

3. Put our 'secret sauce' to work

4. Follow up to ensure
forests are thriving

OBJECTIVES

OBJECTIVES	INITIATIVES
01 To develop a new planting method in achieving time and cost-saving	Creation of Sarawak's designer seed-bombs known as SaraBom
02 To fast-track the rehabilitation and reforestation effort especially in inaccessible forest areas	Use of drone to maneuver precision planting where reach is limited
03 To generate forestry-related revenue through commercialization and mass production of seed balls	Engagement of forestry-related industries and local community

OVERVIEW OF THE PROJECT

May, 2021

Sarawak's "designer seed-ball" @ SaraBom project was initiated to speed up the goal of growing and expanding Sarawak's forest cover.

300,000 seed balls of six indigenous forest tree species were deployed in 2022

Neolarmackia cadamba, Nauclea orientalis, Duabanga moluccana, Cratoxylum arborescens, Syzygium grande, and *Campnosperma coriaceum*

SaraBom - improved biological capacity resulting in healthy plant growth, increase germination percentage, and increase seed resistance to predators & harsh environments.

SEEDBALL/EARTH BALL/NENDO DANGO

TESTED COMPOSITION MIXTURE OF SEEDBALLS

Premix mixture
(coco peat, burnt soil, river sand, burnt husk, rich humus, charcoal powder)

Clay as binder

Soil

Compost

Water

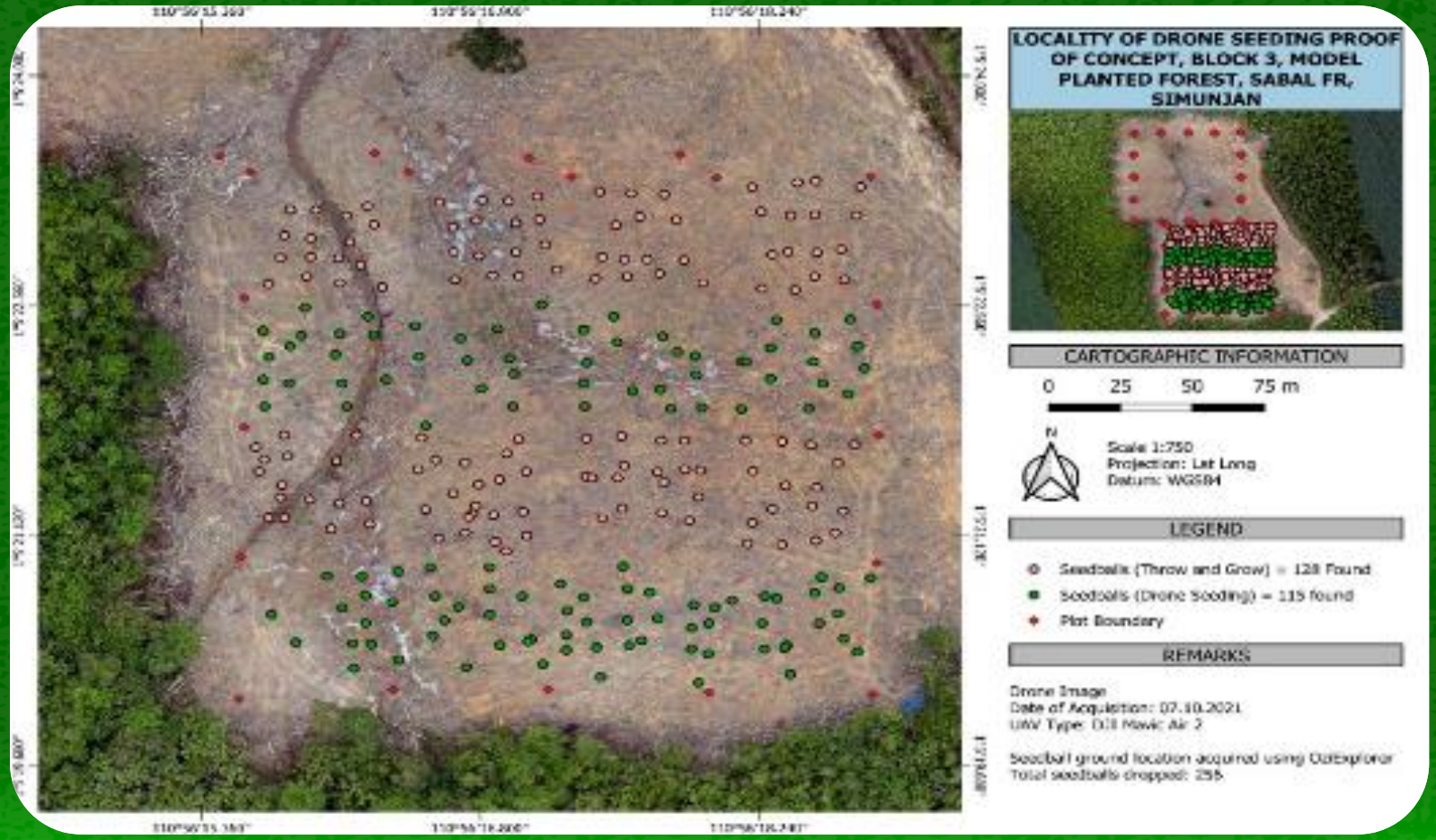
NURSERY TRIALS

COMPOSITION TRIALS

TRIAL PLOT


Kampung Lubuk Ria, Serian
Established in May 2022
Bandar Seri Begawan
Brunei
Miri
Niah
Bintulu
Mukah
NORTH KALIMANTAN
Belaga
Longbia
SARAWAK
Sibu
Sarikei
Kapit
Kuching
Kota Samarahan
SaraBom Seedball Research Area
Betong
Simanggang
Borneo
Legend
SaraBom Seedball Research Area
N
200 km
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus

IMPLEMENTATION TRIAL



TESTED TREE SPECIES

01 *Nauclea orientalis*

02 *Neolarmackia cadamba*

03 *Duabanga moluccana*

04 *Cratoxylum arborescens*

05 *Syzygium grande*

06 *Campnosperma coriaceum*

RESULTS

WHAT SPECIES MANAGED TO EMERGE?

Main species found germinating:

- *Nauclea orientalis*
  Common name: Empitap
- *Neolamarckia cadamba*
  Common name: Kelampayan
- *Cratoxylum arborescens*
  Common name: Geronggang
- *Duabanga moluccana*
  Common name: Sawih

Nauclea orientalis
Common name: Empitap

Most found species germinating in the research area.

Native species that is adaptive in various types of vegetation.

According to Riany et al., 2018, **this species can be the best choice for a replantation program** in the riverside area.

Empitap seedlings were able to grow in lower soil area which are prone to be water-logged.

Nauclea orientalis
Common name: Empitap

Healthily growing Empitap seedlings.

Cratoxylum arborescens
Common name: Geronggang

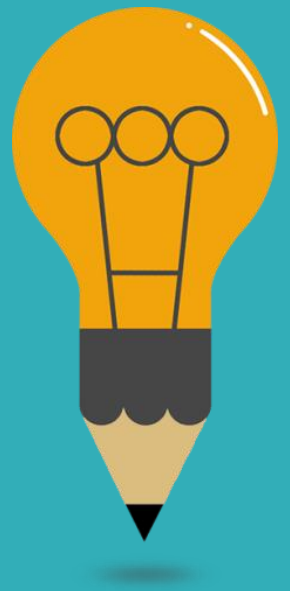
Healthy and robust Geronggang trees observed in the research area.

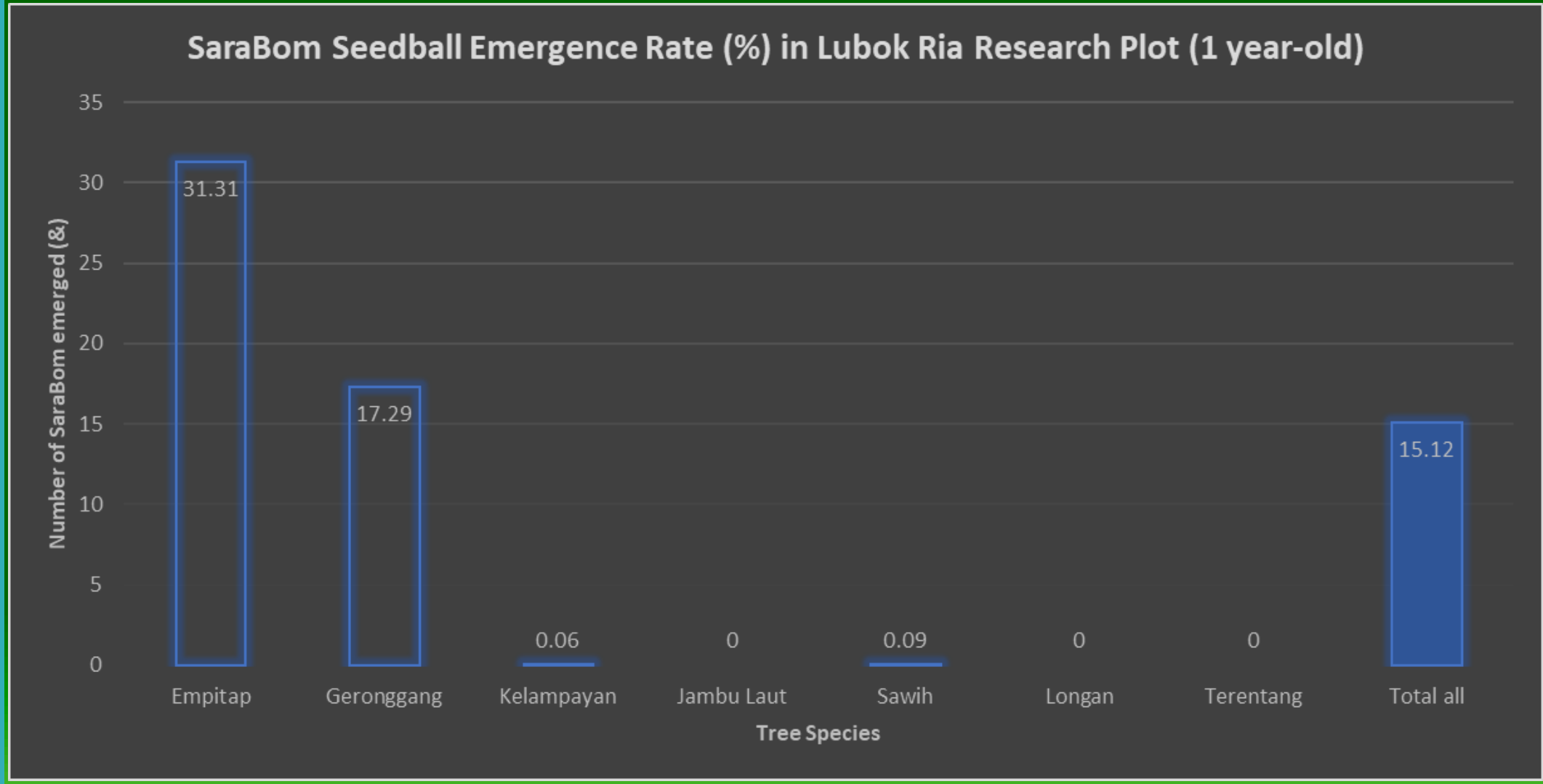
Neolamarckia cadamba Common name: Kelampayan	*Duabanga moluccana* Common name: Sawih

- Kelampayan and sawih were observed to occur in a lesser number as compared to Empitap and Geronggang.
- However, the number of seedlings emerging was seen **increasing** as more maintenance work are done

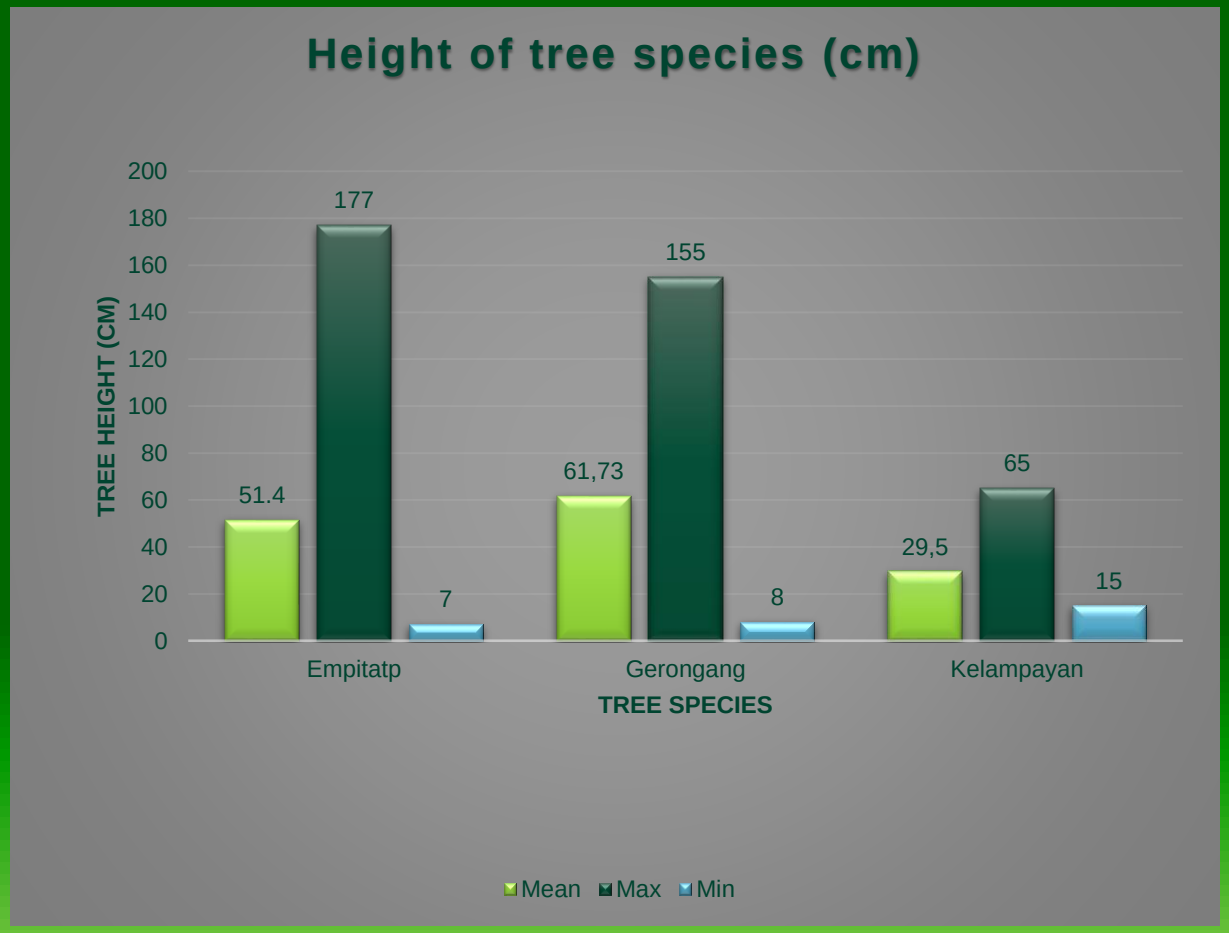
EMERGENCE RATE (%)

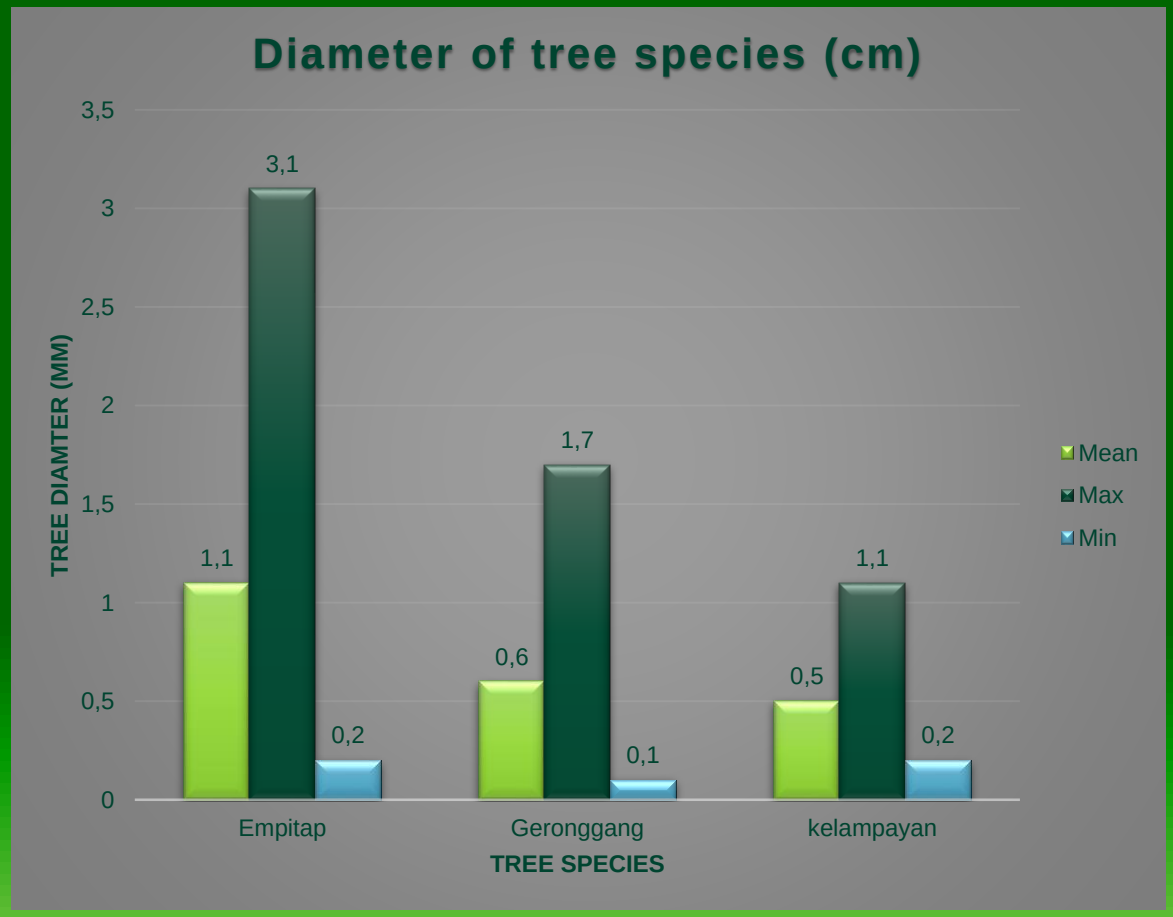
15.12 % Emergence





TREE GROWTH ASSESSMENT

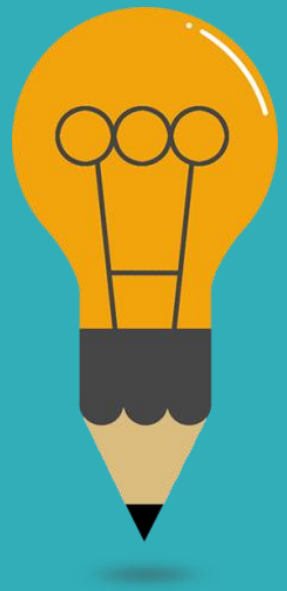




GERMINATION TESTS CONDUCTED IN THE LABORATORY

COMPARE TO THE FIELD

Germination Rate (%)		
Species	Laboratory (Control)	Lubuk Ria (Field)
Empitap	80.5	31.31
Geronggang	30 - 60	17.29
Kelampayan	50-90	0.06
Jambu Laut	42.8	0
Terentang	N/A	0
Sawih	* 12.34 – 30.17 seedlings/day	0.09
Longan	70	0
* No study found on germination rate of Terentang and Sawih		



SUSTAINABILITY

PROTOTYPE ENCHANCEMENT

- SEED BULLET TECHNOLOGY
- MOA UNIVERSITY PUTRA MALAYSIA (UPM) in Nov 2022
- DRONE SEEDING ECOSYSTEM RESTORATION

ENVIRONMENT-COST FRIENDLY

- SOIL
- COMPOST DERIVED FROM OIL PALM WASTE
- 1 SEED BALL = RM0.03 CENTS

STRATEGIC COLLABORATION

- SARAWAK PLANTED FOREST SDN BHD
- JAPAN- MALAYSIA ASSOSIATION

Promoting Social Forestry

SUSTAINABLE DEVELOPMENT GOALS

TARGET 15.2

END DEFORESTATION AND RESTORE DEGRADED FORESTS

By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.

TARGET 1.2

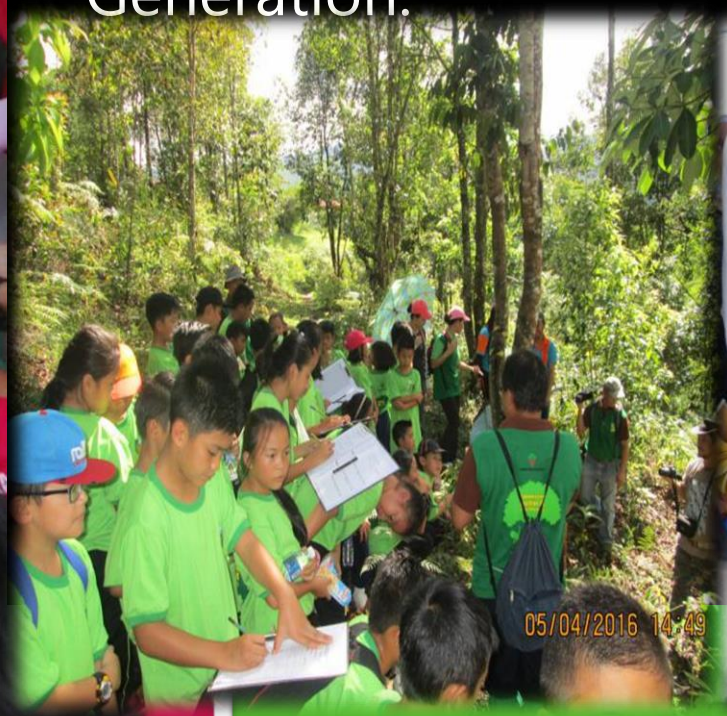
REDUCE POVERTY BY AT LEAST 50%

By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.

- Local communities hired as workers in FDS nurseries
- Daily paid workers in planting and maintenance activities
- Purchase of seeds/seedlings/wildings
- Transport rental, homestay services
- Agroforestry projects

Engagement of local communities in assisting the processes of seedball preparation and forest seed sourcing.

Encourage Environmental Awareness In The Younger Generation.



Daily-paid for planting and maintenance activities

CONCLUSION

DIGITAL PLANTING TECHNOLOGY : SUCCESSFULLY DEVELOPED SARABOM WHICH IS INTEGRATED WITH DRONE FOR ALTERNATIVE PLANTING METHOD

ENVIRONMENTAL SUSTAINABILITY : INCREASE FORESTED AREAS FOR SUSTAINABLE FOREST MANAGEMENT

ECONOMIC PROPERITY: ALTERNATIVE REVENUE GENERATED FOR THE LOCAL COMMUNITY

ACHIEVEMENTS

PUBLIC SERVICE INNOVATION ASIA 2023

Gold Award for Public Service Innovation Asia at the Malaysia Technology Expo 2023

ACHIEVEMENTS

2022 DIGITAL ECONOMY AWARD

WINNER for
Research & Development (R&D)
and Commercialization Award in the
Digital Economy Award, IDECS 2022

ACHIEVEMENTS

46TH INTERNATIONAL CONVENTION ON QUALITY CONTROL CIRCLES 2021

2021

Garnered the highest recognition "Par Excellence Award" at the 46th International Convention on Quality Control Circles 2021, Hyderabad, India

THANK YOU

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