

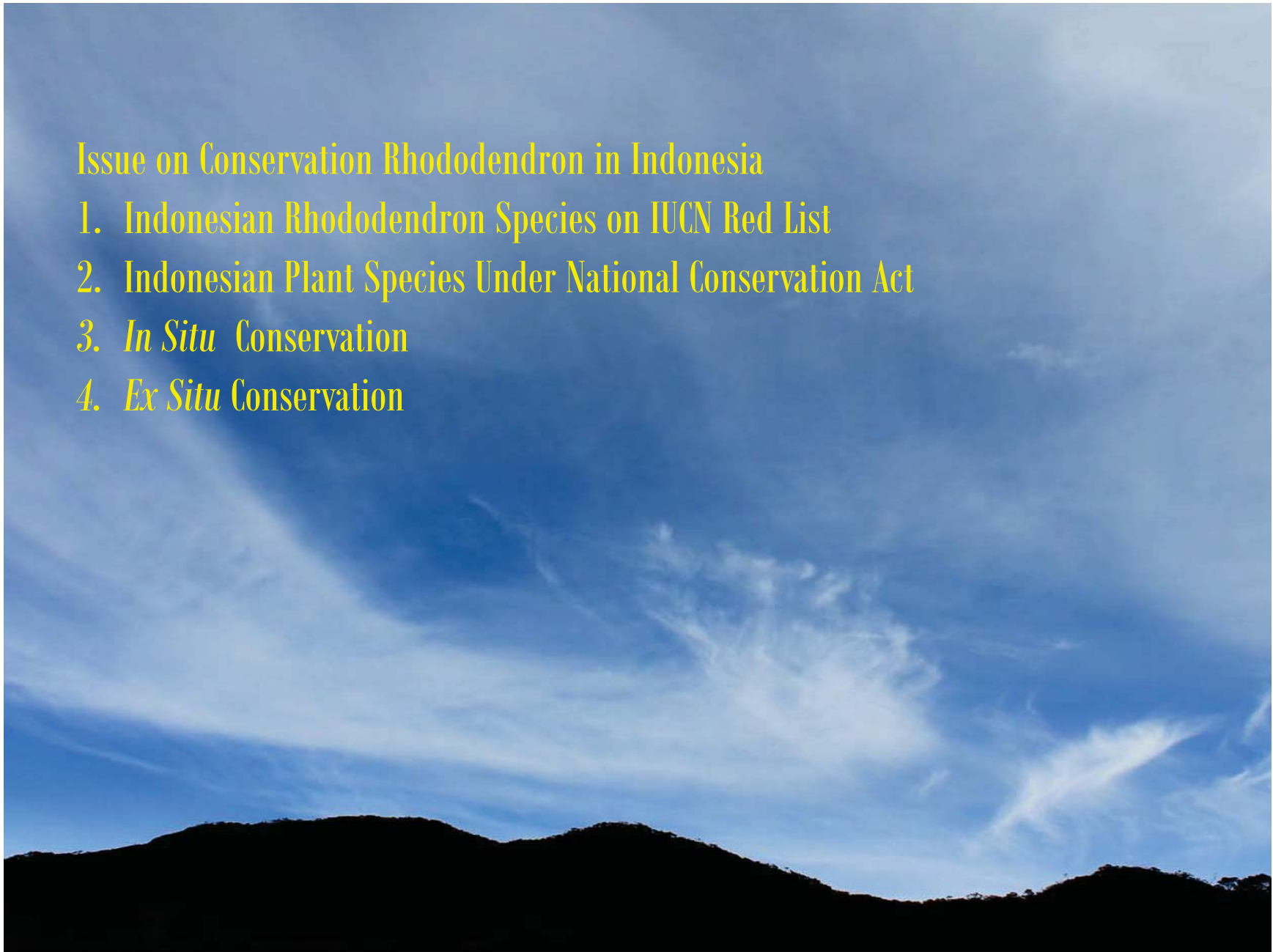
Vireya Rhododendron Conservation in Indonesia

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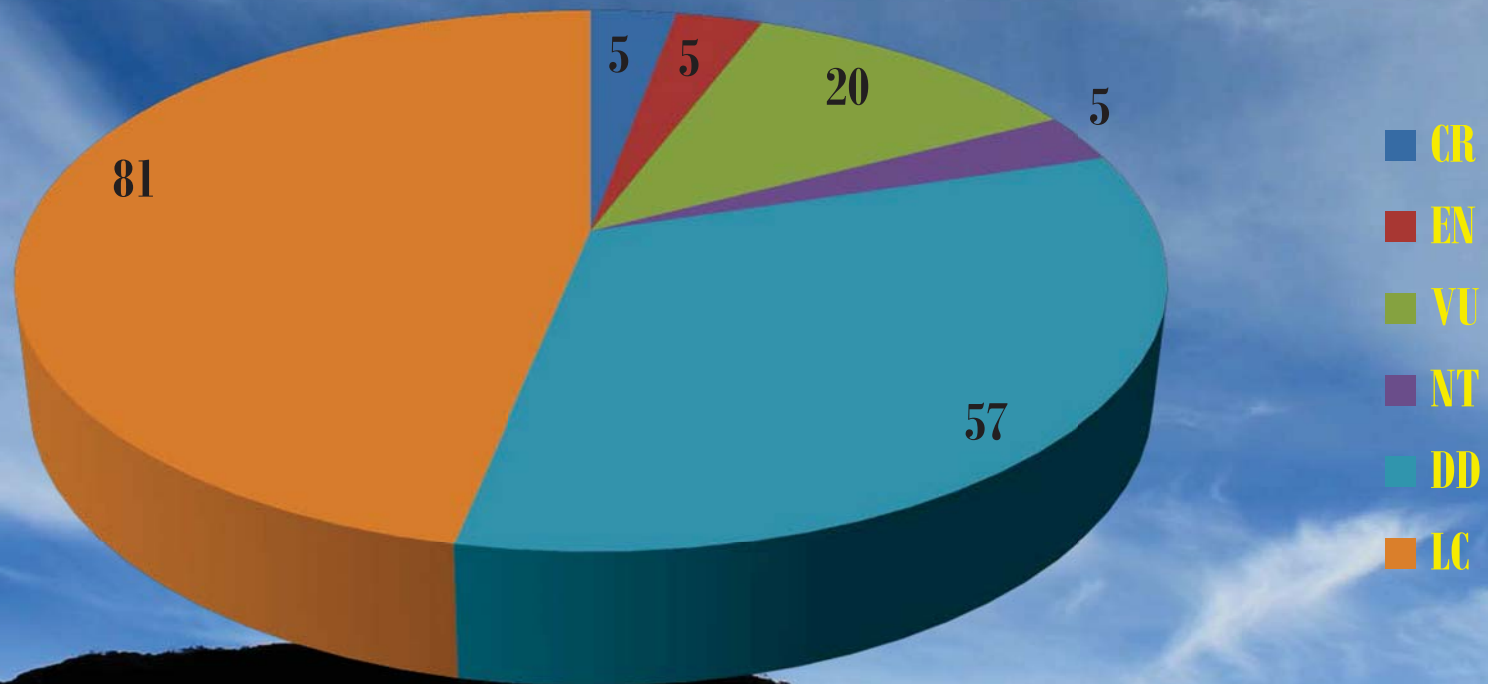
Issue on Conservation Rhododendron in Indonesia

1. Indonesian Rhododendron Species on IUCN Red List
2. Indonesian Plant Species Under National Conservation Act
3. *In Situ* Conservation
4. *Ex Situ* Conservation



1. Indonesian Rhododendron Species on IUCN Red List

About 173 Species of Rhododendron occurs in Indonesia. Mostly are Vireya.
30 species are threatened (Gibbs *et al.*, 2011)



Critical Endangered & Endangered Species of *Vireya Rhododendron* in Indonesia



Vulnerable Species of Indonesian Vireya Rhododendron



2. Indonesian Plant Species Under National Conservation Act (Appendix PP No. 7 Thn. 1999)

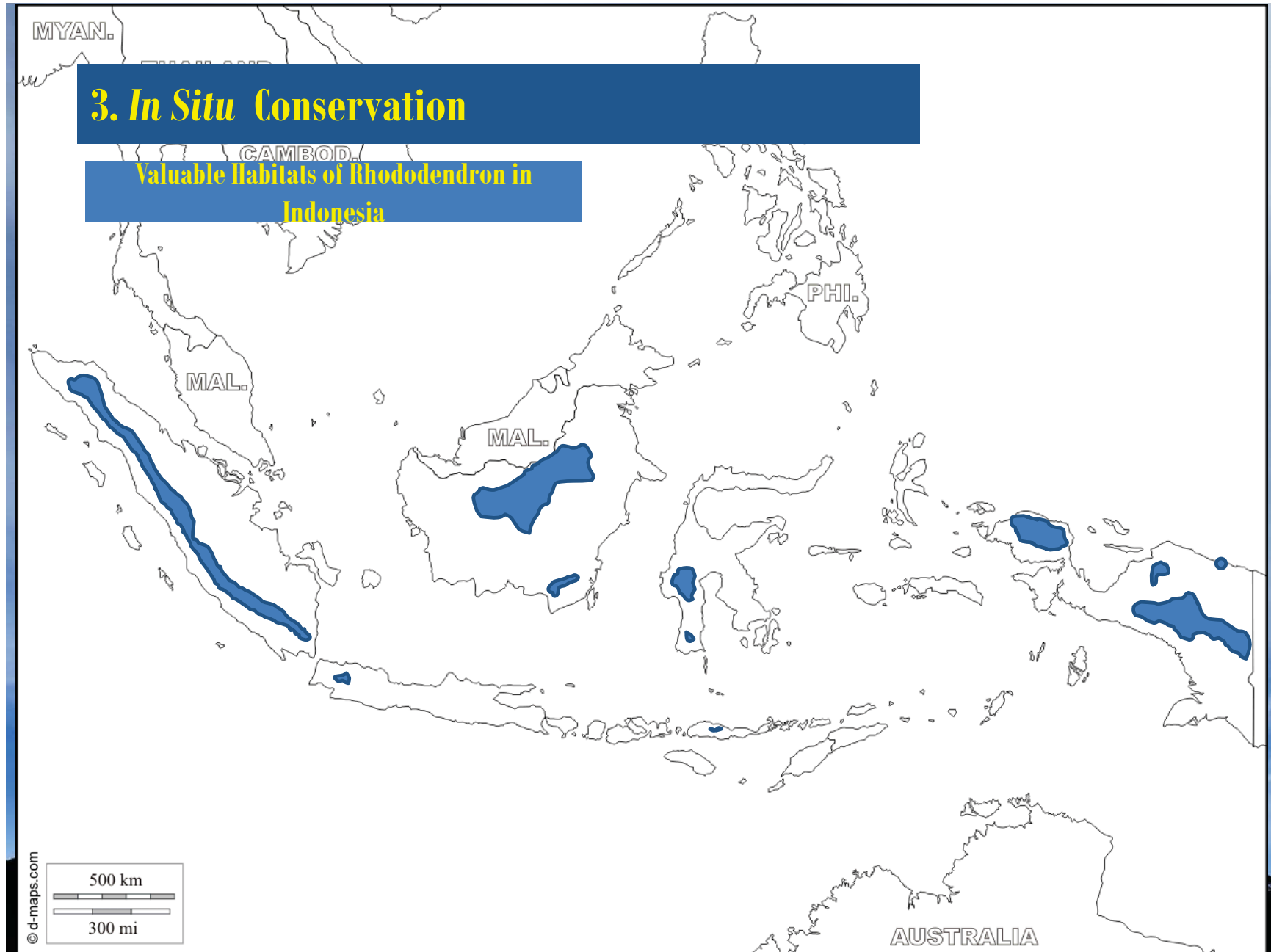
1. **Palmae:** *Borrasodendron borneensis*, *Caryota no*, *Ceratolobus glaucescens*, *Cystostachys renda*, *Eugeissona utilis*, *Johannesteijsmania altifrons*, *Livistonia spp.*, *Nenga gajah*, *Phoenix paludosa*, *Pigafaeta filaris*, *Pinanga javana*
2. **Rafflesiaceae:** *Rafflesia spp.*
3. **Araceae:** *Amorphophallus decussilvae*, *Amorphophallus titanum*
4. **Orchidaceae:** *Ascocentrum miniatum*, *Coelogyne pandurata*, *Corybas fornicatus*, *Cymbidium hartinahianum*, *Dendrobium*, *Grammatophyllum*, *Macodes*, *Paphiopedilum*, *Paraphalaenopsis*, *Phalaenopsis*, *Renanthera Spathoglottis*, *Vanda*.
5. **Nepentaceae:** *Nepenthes spp.*
6. **Dipterocarpaceae:** *Shorea spp* (12)

Notes:

- The Act has not been revised for almost 14 years
- No Ericaceous plant included under the act

3. *In Situ* Conservation

Valuable Habitats of *Rhododendron* in
Indonesia



3. *In Situ* Conservation

National Forest Act (UU No. 41 Thn 1999),
Classified Indonesian Forest based on its Function as:

1. Production Forest (55,017,134 ha)
2. Protected Forest (32,211,814 ha)
3. Conservation Forest (21,232,007 Ha)

The remaining *Vireya*
Rhododendron habitats
mostly occurred in
Protected Forest &
Conservation Forest.

Protected Forest: Focus on conserving ecosystem services, Less concern on Biodiversity, Manage by local government, High Risk to degradation, e.g. Latimojong Highland, Arfak Highland, Mt. Sumbing, Meratus Highland.

Conservation Forest: Focus on conserving Biodiversity and its ecosystem, Manage by Forestry Ministry, Less Risk to degradation, e.g. Leuser National Park, Mt Singgalang Tandikat Nature Reserve, Halimun Salak National Park, Bukit Baka-Bukit Raya National Park, Lorentz National Park.



Potential Threats of Vireya's Population in nature are:

- 1. Land use changes: Agricultural encroachment & Mining**
- 2. Alien invasive plants**
- 3. Overexploitation**
- 4. Natural catastrophes**
- 5. Climate change**

**Massive small scale agricultural extensification on
Latimojong highland protected areas in Sulawesi**



**The Natural forest Cleared for Coffee Plantation on
Latimojong highland protected area in Sulawesi**



Natural Vegetation Changes to Pine Forest on Mountainous Area in Latimojong Highland



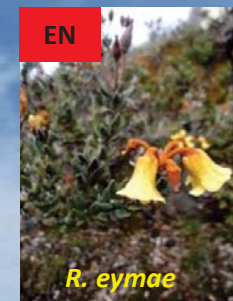
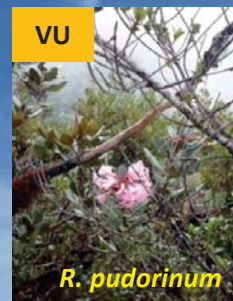


Tin mining in bangka-belitung islands, changing natural vegetation. After the lowland destroyed, probably they will move to the highland where the endemic *R. longiflorum* var. *bancanum* occurred. It has converted 16,869 ha of protected areas in this island. (rimanews.com/20.03.2013)

Natural catastrophes such as volcano eruption. Mt. Salak was erupted several times since 1667 to 1935. This area is the habitats of *R. wilhelminae*.



In Situ conservation are the goals of the Conservation Programs. It is effective to conserve ecosystem, species, and genetic diversity. For example, on Mt. Rante Mario, we can conserve at least 12 species of Vireya Rhododendron



Case Studies of Endangered Species *R. eymae* & *R. nanophyton* var. *nanophyton*



R. eymae



R. nanophyton var. *nanophyton*

Those species categorize as EN D,
Point endemic on the Summit Mt. Rante Mario, South Sulawesi. Population (<100 mature individuals) and ranges (<1km²). The Mountain were part of Latimojong Protected Forest.

Measuring Population Size



To measure the population size, 7 belt transect were made. Each transect has 20 of 5m x 5m plot. It is cover 3500 m².

No	Plot	No. of Individuals	
		<i>R. eymae</i>	<i>R. nanophyton</i> var. <i>nanophyton</i>
1	Plot-1	0	0
2	Plot-2	30	0
3	Plot-3	63	0
4	Plot-4	133	0
5	Plot-5	92	0
6	Plot-6	0	0
7	Plot-7	0	4
	Total	318	4
	Estimated no of individuals ha ⁻¹	908.6	11.4
	Estimated no of individuals km ²	90,860	1,140

Proposed to change the category from EN D to EN B2ac

Habitats Specificity

The Vegetation on the top of
Mt. Gunung Rante Mario



With Tree, Shady or not very open place,
Have a Humus/soil layer, Plant diversities
are relatively high.

Rhododendron : *R. nanophyton*, *R.*
lagunclicarpum, *R. pseudobuxifolium*



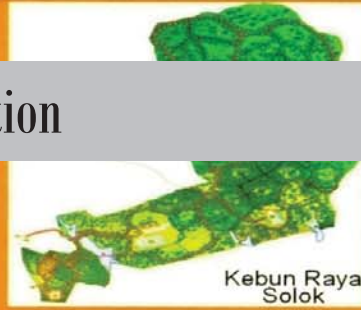
Open area, Rock without humus layer,
Plant diversities are raltively low

Rhododendron : *R. eymae*

4. *Ex Situ* Conservation



Kebun Raya Balikpapan



Kebun Raya Solok



Kebun Raya Baturraden



Kebun Raya Danau Lait



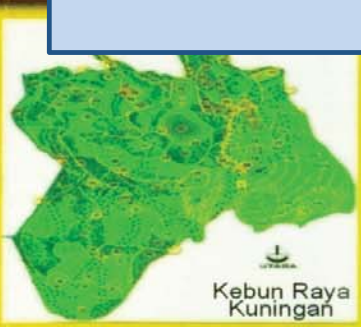
Kebun Raya Kendari

Botanic Garden

Indonesia already have four Botanic Gardens, under the supervision of Indonesian Institute of Sciences (LIPI). But since 2005, LIPI has been tried to boost the number of new Botanic Garden in Indonesia. Nowadays, Indonesia has developed 21 new Botanic Gardens under the supervision of Local Governments.



Kebun Raya Kendari



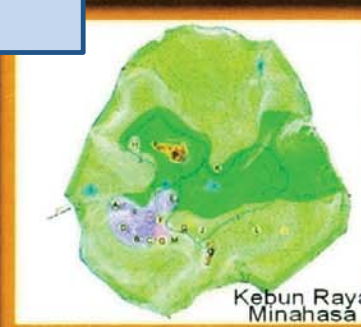
Kebun Raya Kuningan



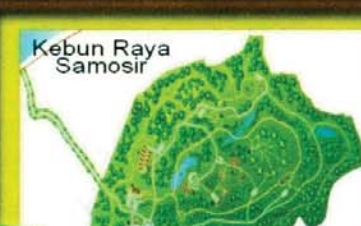
Kebun Raya Liwa



Kebun Raya Lombok



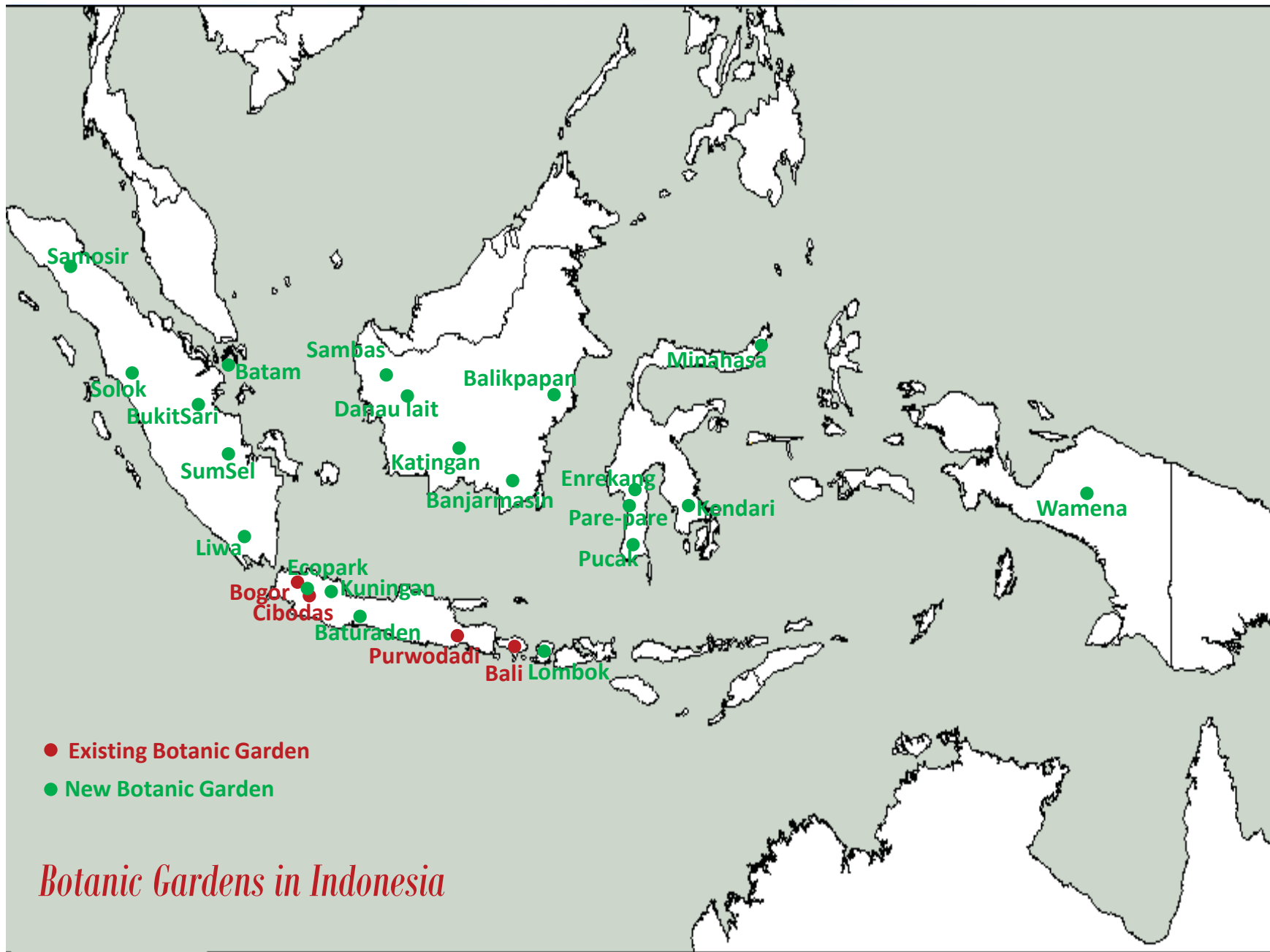
Kebun Raya Minahasa



Kebun Raya Samosir



Kebun Raya Sambas



Botanic Gardens in Indonesia

Limited gardens that have similar Elevation with Vireya's Natural habitat. Therefore, It need an International Collaboration

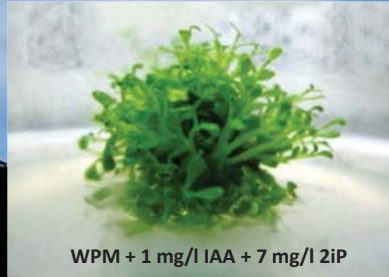
No	Botanic Garden	Province	Elevation Range	Theme of Collection
1	Bogor	West Java	200-260	Wet Region of Lowland Indonesian Plants
2	Cibodas	West Java	1275-1425	Wet Region of Highland Indonesian Plants
3	Purwodadi	East Java	250-300	Dry Region of Lowland Indonesian Plants
4	Bali	Bali	1300-1400	Dry Region of Highland Indonesian Plants
5	Samosir	North Sumatra	1100-1200	Highland of North Sumatran Plants
6	Solok	West Sumatra	599-699	Indonesian Plant Spices
7	Bukit Sari	Jambi	50-75	Lowland of Sumatran Plants
8	Batam	Riau Arch.	9-49	Small Islands Plants of Indonesia
9	Sumsel	South Sumatra	50-100	Medicinal and Wet land Plants of Sumatra
10	Liwa	Lampung	890-950	Indonesian Ornamental Plants
11	Ecopark	West Java	200-230	Lowland Indonesian Plants
12	Kuningan	West Java	500-858	Rock Plants of Mt. Ciremai
13	Baturaden	Central Java	700-900	Mountain Plants of Java
14	Lombok	West Nusa Tenggara	480-549	Lesser Sunda Plants
15	Sambas	West Kalimantan	32-75	Riparian Plants of Kalimantan
16	Danau Lait	West Kalimantan	15-95	Equatorial Plants
17	Katingan	Central Kalimantan	40-70	Indonesian Tropical Fruit Plants
18	Banua	South Kalimantan	50	Kalimantan Medicinal Plants
19	Balikpapan	East Kalimantan	50-70	Indonesian Timber Plants
20	Pucak	South Sulawesi	100-200	Indonesian Economic Plants
21	Pare-Pare	South Sulawesi	50-100	Coastal Plants of Wallaceae Region
22	Enrekang	South Sulawesi	70-155	Lowland Plants of Wallaceae Region
23	Minahasa	North Sulawesi	900-1100	Highland Plants of Wallaceae Region
24	Kendari	South East Sulawesi	459	Ultrabasic Plants
25	Wamena	Papua	1600-1700	Highland Plants of Papua

CONSERVATION ACTIVITIES

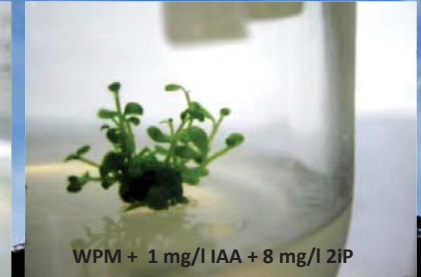
Botanical Expedition



Propagation



WPM + 1 mg/l IAA + 7 mg/l 2iP

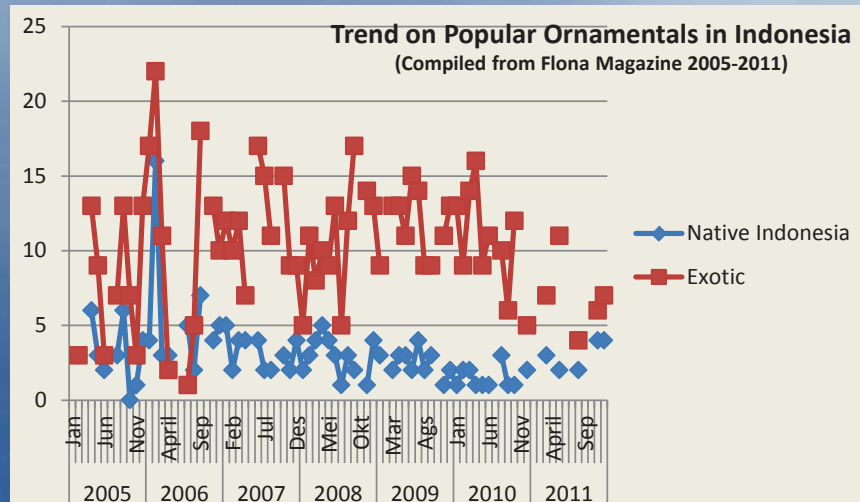


WPM + 1 mg/l IAA + 8 mg/l 2iP

NEXT PROJECT ON VIREYA CONSERVATION

Raising Indonesian Public Awareness on Vireya Rhododendron Conservation:

1. Publishing Vireya Cultivation Book
2. Introduction Vireya to the Indonesian Home Garden



ACKNOWLEDGMENT

DR. GEORGE ARGENT

Royal Horticultural Society (RHS) BURSARIES



CIBODAS RHODODENDRON TEAM 2012-2013