## Forest Management in Peninsular Malaysia -**YOU Decide**



What matters in forest management, and which state does it well? A story built on 20 years of forestry data in

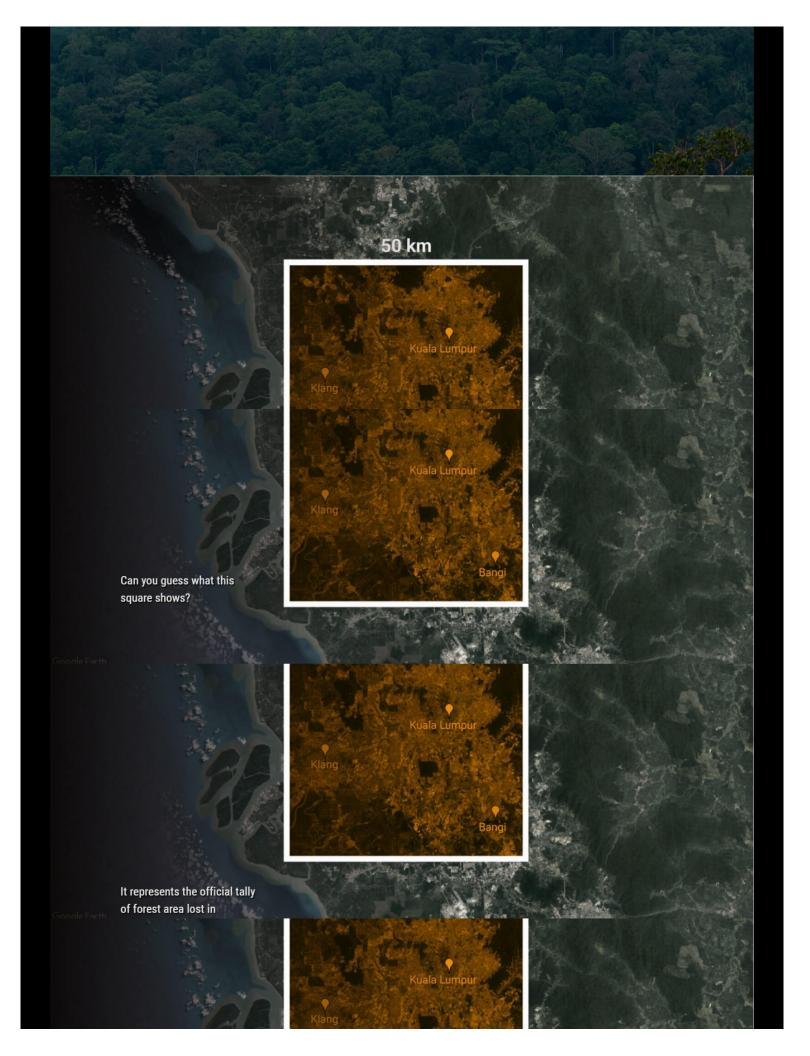
Peninsular Malaysia.

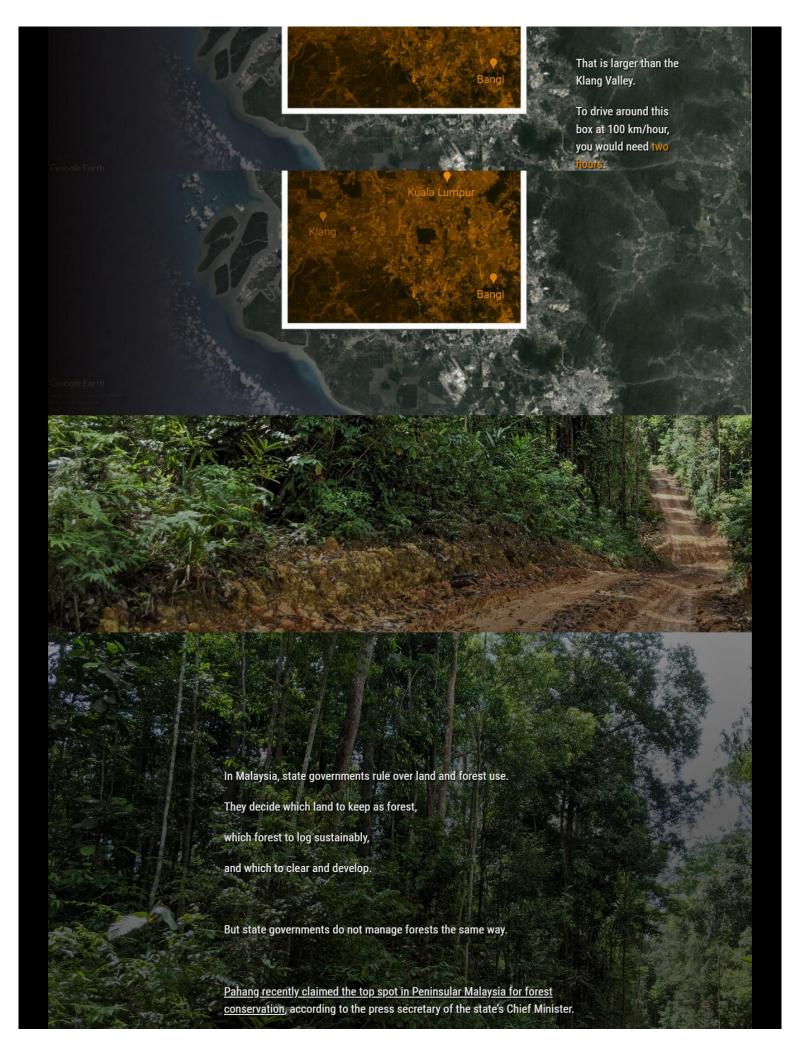
Producer/Writer: YH Law; Editor: SL Wong.

Produced in collaboration with the Pulitzer Center's Rainforest Investigations Network.

Published: 11 August 2021

(Cover photo: From Bukit Awan to Gunung Tahan, by SK







What do you think?

Which state do YOU think manages its forest well?

Answer this quiz below before you scroll further.



Were you surprised by some of the answers in the quiz?

We were.

We structured the quiz around six criteria of good forest management, and some states did unexpectedly well in certain criteria but terribly in others.

## **Forest Management**



1. Area of permanent reserve forest



Increase in forest reserves



3. Forestry revenue



4. Maintaining timber harvest



5. Certification in sustainable forestry



6. Primary forest cover

We chose these criteria as they address both conservation and economic use of forest.

They also match the goal of Malaysia's National Forestry Policy (PDF):

To sustainably manage forest reserves for maximum economic, environmental, and social benefits.

Read on to learn more about these criteria and how states rank according to them.

We hand you the reins of power at the end.

## Criterion #1:

### **Area of Permanent Reserve Forest**

Permanent reserve forests (or just 'forest reserves') are a key component of forest management in Malaysia.

Forest reserves are managed by state forestry departments. They can be logged using sustainable practices.

For example, loggers can reduce roads



and ecological damage by using the 'logfisher' method to pull logs, as seen in the video here.

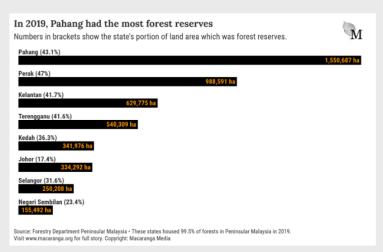


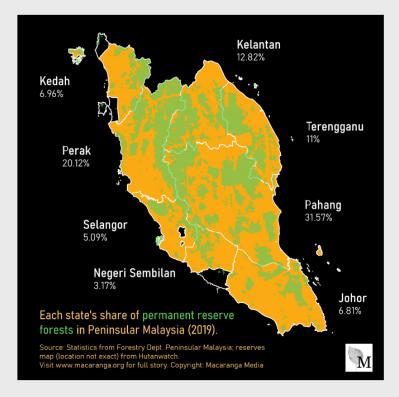
Clear-felling is not allowed inside forest reserves, though there have been exceptions.

State governments alone have the <u>authority to add, remove or reclassify</u> forest reserves.

In Peninsular Malaysia, Pahang had the largest forest reserve area in 2019.

Here is a map of permanent reserve forests in Peninsular Malaysia and each state's share.





### Criterion #2:

### **Increase in Forest Reserves**

State governments can <u>add or remove</u> <u>forest reserves</u> as they see fit.

The <u>National Forestry Act 1984</u> says that a removal shall be replaced with another piece of land of equal area.

But only wherever possible and if the state government deems it beneficial to the national interest.

#### AKTA PERHUTANAN NEGARA 1984

Pihak Berkuasa Negeri hendaklah menggantikan kawasan tanah yang dikeluarkan daripada hutan simpanan kekal

12. Jika mana-mana kawasan tanah dikeluarkan di bawah seksyen 11, Pihak Berkuasa Negeri hendaklah, jika boleh dan sekiranya berpuas hati bahawa adalah demi kepentingan negara berbuat demikian setelah mengambil kira:

•••

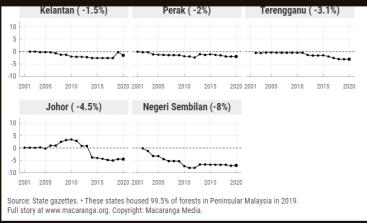
•••

menjadikan dengan mengikut seksyen 7 suatu kawasan tanah yang lebih kurang sama luasnya sebagai suatu hutan simpanan kekal.

Between 2000–2019, Kedah increased its forest reserves by 10.6%, the most in Peninsular Malaysia.

But along the way, there were many – and often big – changes.

Tap on the data points for more details.



A Classick short

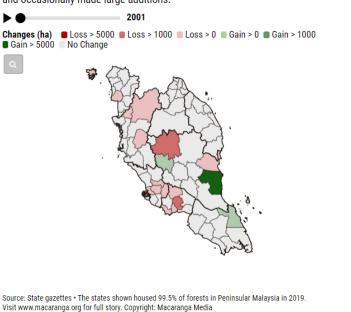
Are you interested in the forest reserve changes in a specific district?

Here's an interactive map for you.

## Forest reserve changes: many small losses, a few big gains



Within districts, state authorities often removed small portions of forest reserves and occasionally made large additions.



A Flourish map

## Criterion #3: Forestry Revenue

Here, Datuk Mohd Amar Nik Abdullah, the deputy Chief Minister of Kelantan, is saying in 2019 that <u>the state could</u> <u>stop logging</u>,

if the federal government gave the state its fair share of royalty from petroleum extracted within the state.

Like Kelantan, most other state governments also depend on <u>tax</u> revenue from extracting natural resources.

State governments often say they are forced to log or clear forests for plantations and mines because they have few other means of generating revenue.



And forestry revenue can be a huge sum.

Between 2007–2019, Pahang collected almost RM 1.4 billion in forestry revenue – the most in Peninsular Malaysia.

That's expected because Pahang controls more than one-third of forests in the peninsular.

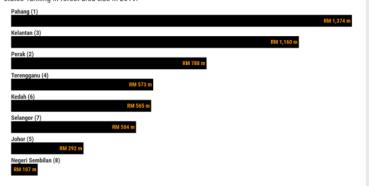
But what's more surprising is that some states (e.g., Johor) with more forest area collect less revenue.

However, if we really want to check how well states extract cash from their forests, a better indicator would be revenue per forest area.

And that shows a very different picture.

Cal	from	£

Forestry revenue collected by state governments between 2007–2019. Numbers in brackets show states' ranking in forest area size in 2019.



M

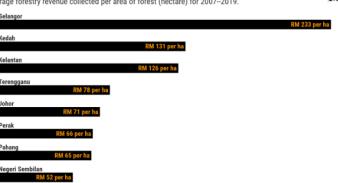
Source: Forestry Department Peninsular Malaysia annual reports. • These states housed 99.5% of forests in Peninsular Malaysia in 2019. Forestry revenue consists mainly of premium and cess for land use, and royalty for logs and other produce. Revenue from national and state parks outside of permanent reserve forest is excluded here because it is not collected by forestry departments.

Visit www.macaranga.org for full story. Copyright: Macaranga Media.

Between 2007–2019, Selangor was the most effective state in monetising forest – RM 233 from every hectare of its forests.

#### Selangor far ahead in making money out of forests

Average forestry revenue collected per area of forest (hectare) for 2007--2019.



Source: Forestry Department Peninsular Malaysia annual reports. • These states housed 99.5% of forests in Peninsular Malaysia in 2019. Forestry revenue consists mainly of premium and cess for land, and royalty for logs and other produce. Revenue from national and state parks outside of forest reserves is excluded.

With tww macaranga.org for full story. Copyright: Macaranga Media.

However, Selangor's feat emerged only after 2010, as yearly data shows.

Tap the data points for more details.

■ How did Selangor do it?

A Flourish chart

# Criterion #4: Maintaining Timber Harvest

The primary goal of the National Forestry Policy and the National Forestry Act 1984 is to sustain timber production for perpetuity.

The focus is permanent reserve forests

- these make up over 85% of forests in
Peninsular Malaysia.

Foresters and state governments want permanent reserve forests to regenerate and produce timber for many generations to come.

This goal requires disciplined logging: only trees tagged by foresters can be felled, roads kept minimum, and plots left to rest and recover for up to 30 years after logging.



Logs harvested in a forest reserve in Johor, 2020. These were logged according to sustainable forestry rules. (Photo: YH Law)

forestry departments maintained the productivity of their permanent reserve forests?

At a glance, timber harvest fluctuated greatly from year to year in the past two decades.

Tap data points for more details.

But we can get a clearer picture by comparing the averages of timber harvest over two decades, e.g., 2010–2019 against 2000–2009.

Furthermore, we can better gauge the productivity of permanent reserve forests by checking the timber per area of permanent reserve forests harvested.

This analysis reveals a worrying result.

Most states in Peninsular Malaysia have not been able to maintain levels of timber harvest.

Only Kelantan has increased both timber harvest and forestry productivity in the 2010s compared to 2000s.

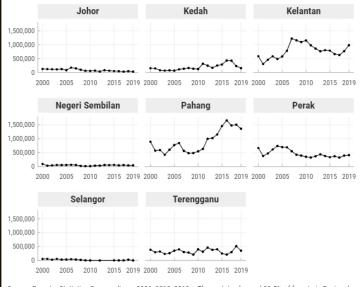
The Kelantan State Forestry
Department did not respond to
Macaranga's questions on its timber
harvest.

While the huge drop in Selangor is due to a logging moratorium which started in 2010, other states like Perak and Johor, which continued to log, also saw declines.

This would suggest that our National Forestry Policy and sustainable forestry practices have failed to keep our natural forests as viable timber stock.

The Perak State Forestry Department did not respond to *Macaranga's* questions on its timber harvest decline.

Logs extracted (cubic meters) from permanent reserve forests vary greatly between years. Data below includes clear-felling of forest reserves to be turned into forest plantations.



Source: Forestry Statistics Compendium - 2001, 2010, 2019. • These states housed 99.5% of forests in Peninsular Malaysia in 2019.

Visit www.macaranga.org for full story. Copyright: Macaranga Media.

A Flourish chart

#### Criterion #5:

## **Certification in Sustainable Forestry**

To show that they are practising sustainable forestry, forestry departments in Peninsular Malaysia can apply for <u>certification</u>.

Standards used in Malaysia include certification by the <u>Forest Stewardship</u>
<u>Council</u> and the <u>Malaysian Timber</u>
<u>Certification Scheme</u> (MTCS).

The MTCS has been endorsed by <u>PEFC</u>, the world's largest forest certification system, since 2009.



Certification Council)

In Peninsular Malaysia, Pahang is the only state to have an unbroken record of MTCS certification for forest management since 2001.

Since 2016, a trend has emerged where the major forested states of Kedah, Kelantan, Johor lost their forest management certifications.

Their certifications were revoked because they breached compliance with the standards.

Neither Kelantan nor Kedah responded to *Macaranga'*s questions on losing their certifications.

These recent certification losses worry the Malaysian Timber Certification Council (MTCC), the body that develops and operates the MTCS.

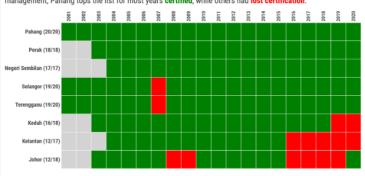
"It indicates increasing competition for land use and a greater challenge to ensure that forest could be maintained as an important land use for socioeconomic development of the states," says Melvin Ku Kin Kin, senior executive at MTCC.

Johor for one excised forest reserves more than the 5% conversion threshold in 2015, and Kelantan zoned certified natural forests into monoculture forest plantations in the same year.

Without certification, timber

#### Certification in sustainble forestry: which state has it? Twenty years since the advent of the Malaysian Timber Certification Scheme

Twenty years since the advent of the Malaysian Timber Certification Scheme for sustainable forest management, Pahang tops the list for most years **certified**, while others had **lost certification**.



Source: Malaysian Timber Certification Council • These states housed 99.5% of forests in Peninsular Malaysia in 2019. In Peninsular Malaysia, state forestry departments apply for the MTCS Forest Management Certification for natural forests in their respective states; forest plantations use a differencertification. Visit www.macaranga.org for the full story. Copyright: Macaranga Media

businesses might lose out as they are excluded from lucrative markets like European Union countries which import only certified timber.



In the Merapoh Forest Complex, a male Rhinoceros Hornbill feeds fruits to its nestling in a tree cavity. (Photo: Izereen Mukri, Malayan Rainforest Station)

## Criterion #6: Primary Forest Cover

<u>Primary forests</u> are mature, ecologically healthy forests that have grown undisturbed for many decades.

These forests provide the most diverse ecosystem services: water catchment, wildlife habitats, carbon sequestration, food security.

When forests are logged or even cleared, they could regrow into primary forests given the right conditions.

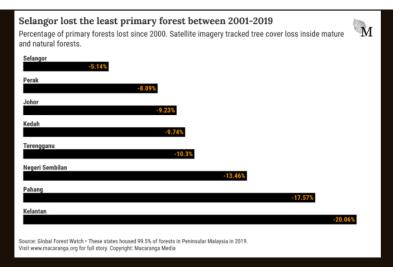
But it requires time. A lot of time.



The Belum-Temenggor Forest Complex, Perak. (Photo: YH Law)

Therefore, it is sound forest management to <u>protect primary</u> <u>forests</u>.

Between 2001–2019, <u>satellite imagery</u> shows that <u>Selangor lost 5.14% of its primary forest</u>, the least in Peninsular <u>Malaysia</u>.



A look at the cumulative loss over time shows that states like Pahang and Kelantan have been losing their primary forest faster than other states.

The Kelantan State Forestry
Department did not respond to
Macaranga's questions on its 20%
primary forest loss.

Tap data points for details.

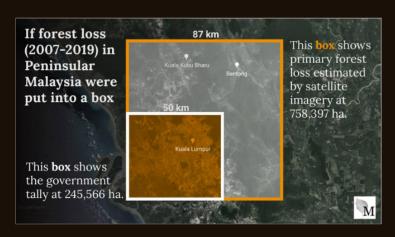
Note however, that primary forest loss deduced via satellite imagery does not tally with forest area changes reported by forestry departments.

That is mainly because satellite images report what is visually on the ground while forestry departments record landuse.

The two sets of data paint very different pictures.

Between 2001–2019, forestry departments in Peninsular Malaysia reported total forest loss of 245,566 hectares.

In contrast, primary forest loss reported by satellite imagery is thrice that at 758,397 hectares.



What could explain this huge gap?

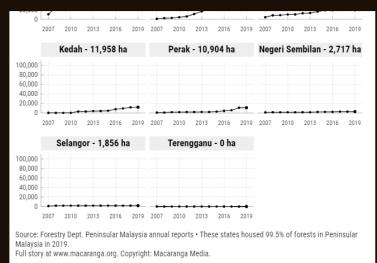
A potentially key component is forest

<u>plantations</u>: estates of single-species fast-growing trees grown for timber and pulp.

Between 2007–2018, Kelantan and Pahang cleared about 180,000 hectares of forests to create such plantations.

All of these 180,000 hectares would have been flagged as forest loss in satellite imagery, but not in government records.

Tap data points for details.



A Flourigh char



A misty Sungai Yu Forest Reserve. (Video: Izereen Mukri, Malayan Rainforest Station)

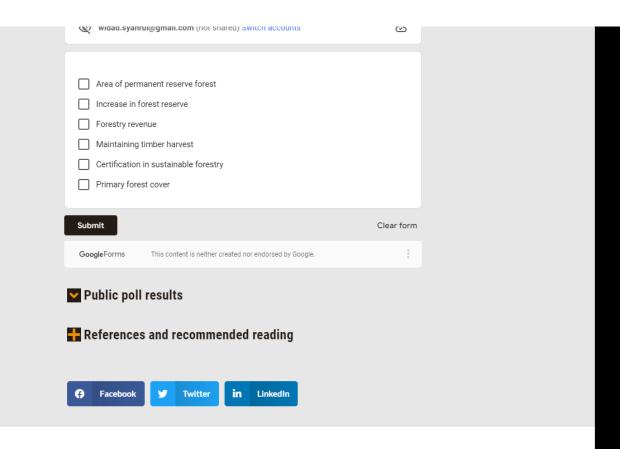
We hope this exercise has helped you to appreciate the many nuances in forest management.

What happens to one forest affects societies far and wide, and generations current and future.

In Malaysia, decisions on forest management are made by state governments aided by forestry departments.

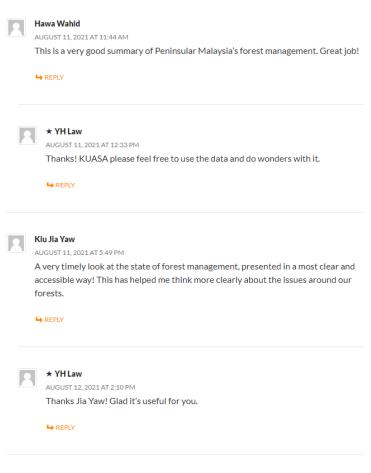
If you were a Chief Minister, which three criteria below would you use to manage your state's forests?

## Forest Management Criteria



Comments are welcomed but shall be moderated. Do not use language that is foul, slanderous, violent or that may violate laws. Personal attacks will not be tolerated.

#### 26 THOUGHTS ON "TWO DECADES OF FOREST MANAGEMENT - YOU EVALUATE"





AUGUST 11, 2021 AT 7:03 PM

Interesting analysis on the state of forest management in P Msia using the latest available data. Differences in forest losses bet FD statistics and satellite data warrant a further look, including the definition of forest land adopted by the government.

REPLY



#### ★ YH Law

AUGUST 12, 2021 AT 2:13 PM

Thanks for reading, Abd Rahim. I think the government has a valid point in defining / measuring forest based on land classification/ land use. After all, a government's role is to plan resources use for the long term, so if they designate a land as 'forest', and plan for it to be used as a forest, then even if it's barren now, in 30 years time it could grow into a secondary forest that can provide many ecological services.

REPLY



#### Aimi Lee

AUGUST 22 2021 AT 12:47 AM

Job well-done. I enjoyed the "interface" between the reader and the article. The findings are a bit surprising – great that hard data was used to establish the findings. On your positive response to Dato' Dr. Abdul Rahim Nik's comments, a hardened, retired forester had this to say: "There is no way that empty land can last one year, let alone 30 years to grow back into secondary forest. Sadly, our country is packed with opportunistic investors. That piece of land will be in no time be taken up for other developments. Reality is, we keep losing our valuable forest land.".

Thanks for trying to be optimistic.

REPLY



#### **★** YH Law

AUGUST 22, 2021 AT 9:16 AM

Hi Aimi, thanks for reading and for sharing your thoughts. I'd agree that my argument was very optimistic, and that it isn't supported by the consistent decline in primary forest cover estimated by satellite imagery.

I was repeating the rationale of the policy-makers and what the forestry department told me. Whether their expectations panned out in reality in the bigger picture – especially after the Rio Summit of 1992 – I'd say the figures aren't in their favour, but we would need to do tighter monitoring to be conclusive. For one, forestry departments have been showcasing a lot of their rehabilitation & reforestation efforts in degraded land/forests, but I don't recall any independent report that examines the success of such effort.

Also, we would need more data (and maps!), and reliable data at that.

REPLY



#### **KY Liew**

AUGUST 13, 2021 AT 11:32 PM

Excellent effort in compiling the enlightening information!

REPLY



#### **★ YH Law**

AUGUST 15, 2021 AT 10:20 AM

Thanks KY! It was quite an eye-opener for me too.

REPLY



#### Siti Mustapha

Thanks for much for this analysis YH. Kelantan is a very interesting case and I hope that they will be able to overcome the challenges in re-obtaining certification. Looking forward to continue supporting you in your efforts to present the facts and figures, and paint an unbiased picture of forestry realities in the country.

REPLY



#### **★ YH Law**

AUGUST 15, 2021 AT 10:19 AM

Hi Siti, thanks to MTCC for always being responsive to our questions! The rapid rise of forest plantations in Kelantan is indeed...interesting and definitely warrants further examination to check how it is done and what effects it brings.

REPLY



#### Nat

AUGUST 15, 2021 AT 2:06 PM

Thanks for this interactive piece! I think this is a great way for the public to begin understanding the issue in Malaysia before they go more in depth and read your other pieces about this.

I still find myself surprised that "permanent forest reserves" is not what I thought it would be (something put in place to preserve and conserve natural resources). Instead, the primary goal seems to be to produce "sustainable logging". And then, we also have forest plantations for this purpose.

Q: What policies/laws do we have in place — with teeth to bite — in the country that actually prioritises the protection of primary forests (or even secondary forests) for the sake of conservation and preservation, instead of for economic gains?

REPLY



#### **★ YH Law**

AUGUST 15, 2021 AT 2:24 PM

Hi Nat, thanks for reading.

I'd argue that state authorities cannot be expected to leave untouched vast area of land and natural resources just to preserve them, especially when these states do not have developed economies in their cities or outside of forests to generate income. I'd agree that sustainable logging – and any other means of natural resource extraction – be allowed (encouraged even) in the framework of conservation if the extraction is truly done sustainably and proven so. In this sense, I think our National Forestry Act 1984 was heading in that direction. The Act gives the State authority ('state government', and in practice, the State Exco, and ultimately, the Menteri Besar) the highest power to protect forests; likewise, it also gives the same authority the power to remove this protection.

So, which act has teeth? National Forestry Act has plenty of teeth. It's only a question of what the wielder of power chooses to bite.

On the other hand, there's the National Parks Act which grants more power over management of land in national parks to the Federal ministry rather than the State. But even then, the National Parks Act says decisions are to made by State Authority "after consultation with the Minister". Not sure if that means 'must get permission/agreement of Minister' or simply 'consult' cukup.

REPLY



#### Nat

AUGUST 18, 2021 AT 3:35 PM

Thanks Yao Hua! Hmm... Are there any checks and balances in place to ensure that while there are forest used to generate income, there are also forests/natural reserves that have permanent protection and cannot be revoked by the state? In other words, stronger protection for forests (for the sake of conservation/preservation) that is not subject to the whims of whichever state govt is in power then.

If you had a say what would you hope to see? haha

Sorry I can't recall if this was mentioned in previous articles that you've written on this topic. Apologies if I'm making you repeat yourself.

♠ REPLY



#### ★ YH Law

AUGUST 18, 2021 AT 4:14 PM

Hi Nat,

I can only think of the National Parks Act giving that kind of protection you described. Under the National Forestry Act, state governments can change forest reserves in and out of production/protection.

In Selangor, the Khalid Ibrahim government made public consultation/participation a compulsory step before degazettement of forest reserves. That was what happened with the Kuala Langat North Forest Reserve. Though the Selangor government is not bound to act according to the public opinion, many conservationists applaud this step because it alerts the public and gives the public a say. The people's power lies in the votes, kan?

For me, I'd like public participation required nationwide, and make state gazettes free and publicly accessible. Just make these public information truly public, and let society and journalists help government monitor.

A list of recommendations can be found here.

REPLY



#### Kan

SEPTEMBER 4, 2021 AT 1:19 PM

The public may be selective in looking at the data i.e charts or graph, and people may not understand, the public poll results show that, overall it is a very good presentation, syabas!

What's done is done, n land use changes happen here n there, perhaps the fed n state governments can look at how to designate idle lands as reserves n even encourage alienated lands be created as reserves.



#### **★ YH Law**

SEPTEMBER 13, 2021 AT 7:46 PM

Hi Kan, thanks for reading and the encouragement. Much appreciated. As for your suggestion (wish?), one's got to ask what would drive the governments to establish more forest reserves? As for encouraging alienated land (i.e., private land) to be converted to reserves...as the system stands, if I own private land and I want to protect it, I wouldn't make it reserves. Because the govts can change the status of the reserves anytime. If I own the land and I want to protect it, I would do it myself  ${ \mathfrak{Q} }$ !



#### Ahmad Afandi

AUGUST 20, 2021 AT 1:06 PM

Good articles to outline most of the issues with forest management. But I don't agree with all the criteria. One important aspect that was not included is landscape connectivity and biodiversity. Without this, it provides false pitcure. A State can have over 50% of forest cover but it likely is pointless if most of them are fragmented islands that are not connected to each other and larger landscapes. Very likely the biodiversity is low (hutan sunyi).

♣ REPLY



#### **★** YH Law

AUGUST 20, 2021 AT 2:43 PM

Hi Afandi, thanks for your comment. Disagreement and discussion is very welcomed  $\ensuremath{\mathfrak{Q}}$ 

I agree with you that biodiversity and connectivity are important elements of forest health and ecological functioning. In fact, I would say that there are many, many more criteria to look at – take TeckWyn's comment above and Surin's response to start. I didn't want to do a comprehensive list, but rather a list of criteria that is based on the National Forestry Policy (and thus provides a fair ground to evaluate the states' performance) and for which I can get reliable, quantitative data to compare, relatively easy.

Do we have (updated) data that allows for meaningful and objective comparison of forest connectivity in Peninsular Malaysia? There's the Intact Forest Landscapes on Global Forest Watch...but this dataset only qualifies Taman Negara, Belum, and the Krau-Benom forest complex as Intact forest landscapes. I believe there are other datasets, but can it be (relatively) easily to translate into comparable numbers? Could be difficult to explain to general readers too.

REPLY



#### **★ YH Law**

AUGUST 20, 2021 AT 2:46 PM

I'd be happy to get your ideas on how we can compare forest connectivity and biodiversity in forests across the Peninsular Malaysian states. Write to us! (www.macaranga.org/contact/)

REPLY



#### Rimba

JUNE 18, 2022 AT 6:13 PM

 $\label{thm:complex} A mazing \ data \ and \ research! \ Macaranga \ doing \ wonders \ to \ facilitate \ transparency \ on this \ complicated \ topic.$ 

REPLY



#### **FMN**

JULY 26, 2022 AT 5:00 PM

Thank you for the data on the Malaysian forest, especially for the peninsular region. According to Worldbank, Malaysia still has 68% forest cover, which is many folds higher than western countries. Malaysia is also actively reforesting with programs like <a href="https://www.100jutapokok.gov.my">https://www.100jutapokok.gov.my</a>. Can the author highlight this bright spot in our forest management to the global audience?

♣ REPLY



#### ★ Yao Hua Law

JULY 26. 2022 AT 10:28 PM

Hi FMN! Thank you for your feedback.

You are correct that Malaysia's official forest cover is higher than many Western countries. Worldbank's data comes from FAO, and FAO's comes from the Malaysian government (namely, KeTSA). So to be safe, let's use Malaysia's official forest cover, which is around 53-54%. This is still higher than many Western countries. In fact, going by Worldbank's list, the only Western countries with >54% forest cover is Finland, Sweden, and Latvia.

Is this an achievement? I think it is quite wonderful that despite the many pressures (political and economic) to clear forest, we still have 54%. But my reporting has taught me that there are many, many caveats to this one number (54%), often in a negative light, and that discourages me.

My concerns, to name a few:

- 1.54% is the official stats based on registered land use, but what is the reality on the ground? How much of this 54% is actually forested? Satellite analyses produce a far smaller estimation.
- 2. Quantity doesn't guarantee quality. Again and again, our National Forest Inventory shows declining tree volume in our forests. Going by the forestry department's own definition of 'hutan terosot', >50% of the forests in P.Msia is 'terosot'. What achievement is that?

3. Also, why the need to compare to Western countries? Why not look at Japan, and say if the world's 3rd economic powerhouse can have >65% forest cover, why shouldn't that be our benchmark? Why compare vs USA which has 34% or UK's 13%?

4. There is no magical 'forest cover number' that is universally good. Aside from aesthetics and spiritual values, forests offer plenty of ecological, economic, and national security values. Some of these values are better unlocked when forests are cut, some when forests are protected. Everytime we report on forest change, be it addition or removal, our template is: What's the rationale for this decision, and what's the result? Who gains, who loses? Are long-term impact accounted for? IF our forests are managed very effectively and efficiently to maximise these values, I wouldn't be surprised if Malaysians experience fewer disasters and feel the country is more forested even when our forest cover has dropped to 45% from 54%.

5. As for the Kempen 100 Juta Pokok, my point about caveats above applies here too. We may write a story about this...so I shall not say more than this: Sarawak, Sabah, Pahang, and Kelantan are leading the charts, and I would argue that whichever state that develops the most new forest plantations would also plant most trees. And we have reported plenty about the problems with forest plantations in P.Msia.

Sorry that I wrote a wall of text!

REPLY



#### Rainforest Journal

SEPTEMBER 4, 2022 AT 12:56 AM

There is actually a very low amount of primary forest coverage left in Peninsular Malaysia. Most of the primary forest cover that the Forestry Dept touts, is actually highland forest from 750m to 1000+m above sea level that is preserved because 1) Not so much or so valuable timber stock to harvest 2) As watershed protection.

The real primary forest cover is the lowland forest below 300m, and this is VERY, very little. So we broaden it a bit more and define lowland forest as below 750m. But still very little left.

So most of the forest cover that is left is "hutan tersorot" or logged forest. And how degraded it is depends on logging intensity and how many cycles of logging were done.

It's a shame that so much of the remaining forest cover left in Peninsular Malaysia is logged, secondary forest. And most of the primary forest left are in the National Parks and Conservation Areas. And the areas that are not protected, are still in danger of being cleared totally. Sad.

REPLY



#### ★ Yao Hua Law

SEPTEMBER 4, 2022 AT 8:45 AM

Hi Rainforest Journal,

You are right — if we define primary forest as untouched forests, or forests that have progressed to the climax stage. In this article however, we refer to 'primary forests' in the same way that GFW defines it: merely a mature forest that hasn't been disturbed in decades. So a forest that was last logged 30 years ago would count as 'primary forest' now in this article, though it definitely doesn't fit the 'primary forest' you meant.

And yes, I also think it's sad that we have lost so much lowland primary forests. I particularly feel that we had not received/achieved the benefits/progress that corresponds to the value of the rainforests we cut. Primary rainforests are precious and irreplaceable (would we ever have the patience and determination to protect a land for centuries to regrow into a climax forest?).

Johor, for example, a state of mostly lowland forests, now has only 17-21% of forest cover. But how much have the state and its residents enjoyed the

expected economic or development gains that should have come from converting those 80% of forests? Would the state not have benefited more if it kept 10 or 20% of its primary forests?

REPLY

#### LEAVE A REPLY

Your email address will not be published. Required fields are marked  ${}^\star$ 

Comment *	
	/
Name *	
5	
Email *	
Website	
Website	
☐ Save my name, email, and website in this browser for the next time I comment.	



Macaranga.org by Macaranga Media Sdn Bhd is licensed under CC BY-NC-ND 4.0. | CONTACT US HERE | PRIVACY POLICY |