# Recommendations to alleviate the negative impacts of deforestation on biosphere integrity and ecosystem services in the Malaysian Rainforest

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Rationale: This briefing aims to persuade Dr Rosmadi Bin Fauzi that deforestation and its effect on the biosphere integrity planetary boundary should be a research priority. The University of Malaya is one of the most prestigious universities in Malaysia, with research and policy recommendations being developed by their academics, the Ministry of Natural Resources and the Environment in Malaysia may take a stronger stand against deforestation, protect the planetary boundary and fund the implementation of policy needs.

Executive summary:

The Malaysian rainforest and the biodiversity within it are being destroyed by deforestation, mainly for palm oil plantations, which is putting pressure on the biosphere integrity planetary boundary. Biodiversity off-setting, subsidisation of domestic palm oil companies and regulation of international palm oil companies are policy options available to help solve this problem, however, biodiversity off-setting is inappropriate and too complex for Malaysia. Policy recommendations that are most effective bring together subsidising domestic palm oil companies to allow them to become more productive, while simultaneously regulating international palm oil firms to both prevent unethical practices and protect the more sustainable, domestic firms. Most prominently, further research and global collaboration within and between universities such as the University of Malaya and the University of Sao Paulo is needed to learn from success stories such as the slowdown of deforestation in the Amazon rainforest. This aims to create a backbone for sustainable and thought-out environmental policies in the future.

## Empirical analysis:

### Background on biodiversity, ecosystem services, and deforestation in Malaysia

**Biodiversity** or biosphere integrity is a planetary boundary (20) (boundaries on which humanity can operate safely within) that includes species abundance (number of species present in a defined geographical unit, both above and below the soil), and relative abundance (some species are rare, others are common). Deforestation causes biodiversity loss because it destroys habitats and environmental functionality for many species, and therefore threatens the planetary boundary. Deforestation also results in a loss of ecosystem services, which enable and facilitate human well-being (16, piv) in four key ways:

> **Biological diversity**: "the variability among living organisms from all sources […] this includes diversity within species, between species and of ecosystems" (6)

- Support (nutrient cycles, soil formation)
- Regulation (climate regulation, flood regulation, water purification)
- Cultural (aesthetic, spiritual, recreational)
- Provision (food, fresh water)

Malaysia had the world's highest deforestation rate between 2000-2012 at 14.4% (3). Figure 1 demonstrates forest cover loss (2000-2014) and the deforestation in Malaysia and its surrounding countries is extensive (the darker the red legend, the greater the forest loss). The size of the key rainforest in Malaysia is around 6,600 square miles (15), hence why any deforestation causes significant damage as it is a small, concentrated area. Academic research on deforestation in the Brazilian Amazon (with its huge scale of over 4 million square miles (26)) far outstrips research on the Malaysian rainforest, despite when you compare Figure 1

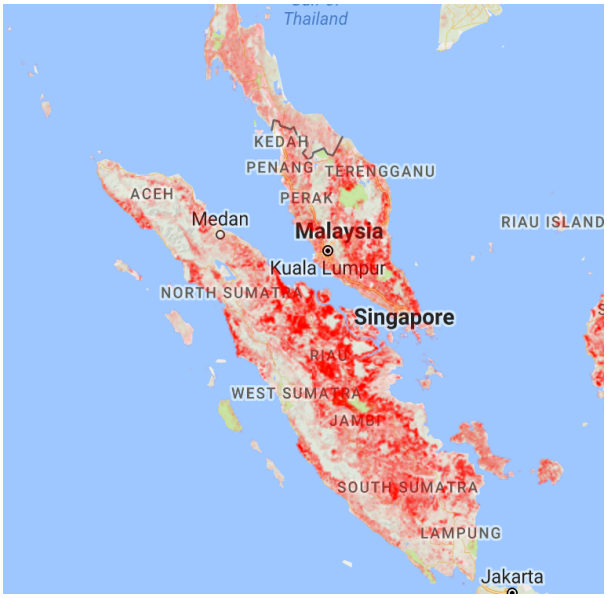


*Figure 1: Forest cover loss (2000-2014) in Malaysia. [transparent] (11)*

and 2, Malaysia appears to have a more pressing need for research and solutions, with far more intense and concentrated forest loss.

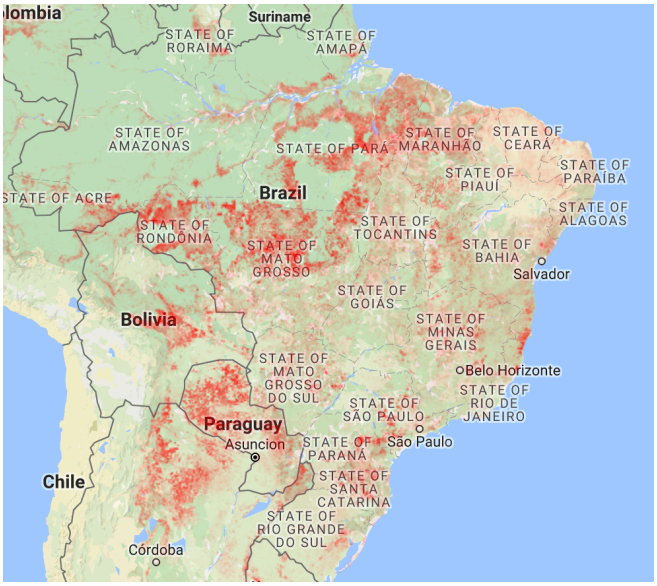

*Figure 2: Forest cover loss (2000-2014) in Brazil. [transparent] (11)*

<u>Causes and consequences of deforestation in Malaysia</u>

The main causes of deforestation in Malaysia are palm oil and rubber plantations (18), which are increasingly profitable industries due to their ability to help the "rural poor" through employment (25, p5). By 2050 palm oil demand is supposed to double to 240 million tonnes worldwide (27). Around 87% of palm oil used globally has been produced in Indonesia and Malaysia (12) and Peninsular Malaysia, home to over 600 different species (28) and the main area of forest, has been 35% developed (19, p303).

The highland forests prevent landslides and flash-flooding as tree roots retain the rainwater in the soil (supporting and regulating services), reducing the amount of water runoff. Therefore, deforestation has caused a rise in flooding in indigenous communities (which affects around 3.5 million people in Malaysia (29, p1)) and threatens sanitation because of increased silt in the water from displaced soil. Deforestation also threatens species such as orangutans, and causes a warmer climate because of decreased albedo (8, p571) (less reflection of solar energy), which may cause drought in the dry season.

<u>Malaysia's current government policies for forestry:</u>

- State planning committees that coordinate and manage natural resources (19, p304).
- National Policy on Biodiversity of 1998 which introduced the idea of a tropical biological research centre (10).
- Sustainable Forest Management System (SFM) Malaysia, which allocates annual timber yields and annual extraction limits in states (10).

- Environmental Impact Assessment (EIA) must be conducted prior to commencement of forest operations (10).
- Permanent Reserved Forests (PRF), which are protected national parks (around 40 in peninsular Malaysia) (13, p2).

## Assessment and analysis of evidence: policy options

Although Malaysia's government has tried to protect the forests and biodiversity, more needs to be done. Possible policy options are outlined below.

### Direct biodiversity off-setting (BO)

Direct BO is "designed to give biodiversity benefits to compensate for losses" (7). For every tree that is cut down, for example, that company or government would have to plant another tree elsewhere or commit to another ecological development project, hence mitigation. This method has been successful in areas such as Queensland, Australia (5, p2). It would be inexpensive for the Malaysian government as they could enforce this law on deforesting institutions so the "polluter pays" (24).

However, this is difficult due to inability to measure complete biodiversity, because of its complexity considering relative abundance and other factors. A loss of ecological functions are attempted to be offset by gains of the same ecological functions such as vegetation density or habitats (4, p7363), but this is extremely difficult to measure in quantitative terms. Do you just value the tree itself or do you count the ecosystem within it? Furthermore, planting a new shrub that will take time to grow does not effectively offset the cutting down of historic woodland. The new shrubs also need to be protected to grow, but companies and governments may not fully commit to this, as "biodiversity interests" are not incentive enough for governments to monitor and stop profitable resource development (23). BO may therefore just be a convenient way for polluters to justify their actions because they can say they are paying for mitigation. However, BO does not even correctly follow the mitigation hierarchy (22) because it ignores the fact that offsetting should be a last resort after avoidance, minimization and restoration. Furthermore, biodiversity off-setting tends to aim for "No Net Loss" (14), but this is not a net positive gain in terms of saving biodiversity, and

therefore does not necessarily prove a successful policy.

Command and control

There are no current policies aimed at palm oil production, despite the fact Malaysia houses Felda Ventures Holdings (FGV), the world's largest palm oil producer based on planted hectares (8). Once state-owned, FGV has been a private company since 2012, but the government should continue to monitor this firm. This is to ensure there is a full devolution of powers to the local farmers to make every piece of land more productive to raise living standards. This could be done by giving subsidies to FGV and other domestic companies to raise wages for farmers to encourage productivity, as shown in examples from Sub-Saharan Africa (17, p1), and avoid the need for more deforestation. However, subsidies are expensive (17, p1) and difficult to implement because they may be too high or too low, which could either encourage companies to merely take the subsidies and not pay their workers more, or mean government spending is too high.

Regulations are also needed to ensure the only international palm oil companies allowed to operate in Malaysia have the Roundtable of Sustainable Palm Oil (RSPO) certification, to prove legitimacy. The Presidential Decree 6.321 in 2007 in Brazil, established the "legal basis" for singling out municipalities with very high deforestation rates and these areas became subject to more vigorous monitoring (2, p3) and since then Amazon deforestation has gone down. This could be drawn upon in Malaysia in high deforested areas, such as the states within the Peninsular. The strength of these recommendations is that they consider the cause of the deforestation problem rather than trying to offset the consequences. However, this approach still encourages palm oil production, which will threaten the biodiversity, so there should be policies alongside this that helps Malaysia limit the continued expansion of palm oil and utilise current production.

## Conclusion, policy recommendations and outlook:

Although the ideal recommendation to save biodiversity from deforestation would be to stop palm oil production all together, this is wholly unrealistic and would cause Malaysia to be at an economic disadvantage. Therefore, the following recommendations consider using

domestic and international palm oil companies (through their subsidisation/regulation), ironically, as crucial to saving biodiversity. Direct biodiversity offsetting is too complicated to implement effectively and lacks convincing evidence, therefore is not listed among the following recommendations.

| RECOMMENDATION | RATIONALE | IMPLEMENTATION TECHNIQUE |
|---|---|---|
| Subsidisation of domestic palm oil companies | If FGV and other Malaysian palm oil companies promote sustainable palm oil and ethical working conditions without the need for further destruction of the environment, then other companies may follow with technological advances to make existing land more productive, because they would need to compete.<br><br>Malaysia firms have more incentives to protect the environment of their own country because it is where they live, so less risk of 'capital flight' and unethical practices. | Reallocate government spending from other departments over the next 5 year election cycle to give more funds to the department responsible for the subsidisation of domestic palm oil firms. This is on the rationale that this will create economic success for Malaysia and increase wages and therefore living standards of workers.<br><br>This cut and reallocation in government spending could be in conjunction with indirect taxation on goods and services to raise money to fund both the other departments and the subsidisation, although taxation is an unpopular policy. |

| | | |
|---|---|---|
| Regulation on international palm oil firms wishing to come into the country | Prevents companies that may exploit or displace Malaysian workers, and destroy the environment, from entering the country.<br>Isolationist and protects the interests of domestic firms and allows them to thrive without the threat of competition that may encourage unethical practice.<br><br>Will also target companies in the main deforesting areas with extra monitoring, which succeeded in Brazil (2, p3), to ensure the real polluters "pay" (23). | Stronger bureaucracy through the Ministry of Natural Resources and the Environment in Malaysia to push through such a regulation on the grounds of protecting biodiversity.<br><br>Ensure that the politicians dealing with this policy recommendation are not affiliated with palm oil companies, and therefore are objective and implement the policy effectively. |
| Research and global collaborations | There is a lack of information regarding deforestation in Malaysia compared to the abundance of books and research papers on the Amazon. Malaysia could use the Amazon success story of slowing deforestation to develop policies for Malaysia. This could facilitate collaborations between researchers in the two countries and utilise Brazil's huge "research capacity" (1, p207). | Apply for grants from the government to enable more research.<br><br>Work for collaborations between universities such as University of Malaya and the Universidade de São Paulo (USP) to enhance research and trade ideas on deforestation. |

The subsidies on domestic companies and regulations on international firms must be taken together to be the most effective, because both recommendations complement each other to encourage and fund domestic firms. The most pressing policy priority, however, is research

and global collaboration between universities and governments. Malaysia cannot solve its deforestation issue without global help, and top-quality research will provide a backbone to sustainability of the biome in the future. The former Prime Minister of Malaysia, Mahathir Mohamad proclaimed the twenty-first to be a “global century” (21, p1), and Malaysian academics and politicians should indeed focus on global collaborations to help solve their local problems.

WORD COUNT: 1980

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