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Scientific Facts on

Valuing the ecosystem of the Indonesian rainforest

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Level 2 - Details on Valuing the ecosystem of the Indonesian rainforest

This is a faithful summary of the leading report
produced in 2015 by The United Nations Office for REDD+ Coordination in Indonesia (UNORCID) (Unorcid):
"Forest Ecosystem Valuation Study: Indonesia. "

The full Digest is available at: https://www.greenfacts.org/en/indonesian-forests/

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- Each question is answered in Level 1 with a short summary.
- These answers are developed in more detail in Level 2.
- Level 3 consists of the Source document, the internationally recognised scientific consensus report which is faithfully summarised in Level 2 and further in Level 1.

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1. Introduction

Indonesia has the highest deforestation rates in the world, exceeding even Brazil while having only a quarter of Brazil's forest area. The major drivers of deforestation are in the following order of magnitude: fibre plantations, logging concessions, oil palm, mixed concessions and mining concessions. To meet demands in international markets even protected forest areas have been targeted for deforestation and a lot of the logging activity in Indonesia is still illegal and unregulated.

The average annual deforestation for the period 2000-2012 was 671,420 hectares (6714 km²). *It isthus necessary to address the urgency of the situation and provide Indonesia's policy-makers with this snapshot to make it clear that the current system is destroying assets on which future prospects are based.*

A significant issue in Indonesia is the deforestation of peat forests and the resulting peat fires. Peatlands are a huge storehouse of carbon and help sequester large amounts of CO_2 from the atmosphere. The social and economic consequences of peatland deforestation are tremendous. From a human health perspective, exposure to the thick haze generated by slow-burning peat is linked to an increase in respiratory diseases, with adverse impacts on economic productivity.

In 2013, the total forest cover in Indonesia was estimated to be 98 million hectares, about half of the total land cover of the country. With the third largest area of tropical forest in the world, Indonesia's forests play a significant role in climate change mitigation at the national and global level. They are also critical for economic growth and the welfare of people. Therefore, recognising, capturing and demonstrating the benefits provided by forest ecosystems in Indonesia can significantly assist the country in transitioning towards a green economy. This can result in equitable growth, stable economic development and preservation of Indonesia's natural assets for its future generations.

2. How important are the Indonesian forest ecosystems ?

Over the last few years, Indonesia has demonstrated considerable leadership in recognising the value of its natural capital. Indonesia's forests provide considerable economic, social, and environmental benefits for its people. Biodiversity plays a key role in food security, human health and livelihoods, providing clean water, timber, medicinal plants and other important services. Biodiversity also enhances community resilience to climate change impacts and contributes to carbon sequestration and climate change mitigation.

Regional and global studies have estimated that when ecosystem services are valued in economic terms, they provide trillions of USD worth of goods and services every year. A valuation study performed in 2003 determined the total economic value (TEV) of the Leuser National Park in Sumatra, Indonesia, using a systems dynamic model to comparatively evaluate the economic consequences of deforestation versus conservation over a 30-year period (2000-2030). Three scenarios were considered: conservation, deforestation, and selective use. The economic benefits considered included: water supply, fisheries, flood and drought prevention, agriculture and plantations, hydro-electricity, tourism, biodiversity, carbon sequestration, fire prevention, non-timber forest products Apart from timber, forests also provide a variety of other products : fruits and nuts, vegetables, fish and game, medicinal plants, resins, essences, and a range of barks and fibres such as bamboo, rattan, and a host of other palms and grasses.

A similar study highlighting the social and economic importance of forests succeeded in engaging stakeholders in sustainable forest management programmes. This study estimated

the contribution of forests to socio-economic development in the Heart of Borneo (HoB), assessed ways to optimize economic growth whilst maintaining HoB's natural capital, and estimated the costs and benefits associated with sustainable landscape management.

Compared to deforestation, conservation proved to benefit all categories of stakeholders, except for the elite logging and plantation stakeholders. The results support the notion that conservation promotes social and economic equity, while deforestation widens the gap between rich and poor. In 2012, the value of timber produced was about 1.5 percent of the GDP. Surprisingly, despite the abundance of timber, the import of wood products in Indonesia has grown gradually : from 2003 to 2013 the import volume increased by 74%. This is because the items representing a major proportion of the imports are pulp, paper and timber products, primarily sawn wood and particle board, which are used in the manufacturing of various furniture items. This can be attributed to the growing consumerism and improved standards of living in Indonesia and the rise in demand for furniture products.

3. Why is it important to put a value on Indonesian forests ?

The Forest Ecosystem Valuation Study (FEVS), undertaken by the United Nations Office for REDD+ Coordination in Indonesia (UNORCID) with funding support from the United Nations Environment Programme (UNEP) seeks to put a measurable value on the ecosystem services provided by forests so that the role of forests in the Indonesian economy and society is better understood. It is not intended as a document for the scientific community addressing the precise role of ecosystem services within the Indonesian biosphere.

It aims to highlight the significance of the contributions provided by Indonesia's forests and their ecosystem services, which are often not accounted for in mainstream decision -making, but nonetheless critical in their socio-economic value. By providing quantitative evidence on the values provided by nature, the FEVS seeks to significantly increase investments in forest ecosystems and promote the sustainable management of these natural resources, leading to higher social equity and sustained long-term economic growth. It aims also to support the integration of green economy principles into forest and land use planning and socio-economic development by providing Indonesian policy-makers with the necessary information to trigger a transition to a green economy.

The FEVS draws its conceptual and methodological framework from internationally recognised assessments such as The Economics of Ecosystems and Biodiversity (TEEB) study, which go beyond traditional measures of growth and support policy reforms that effectively follow the principles of a green economy. The economic valuations provided throughout the FEVS seek to provide a "snapshot" of the substantial contributions from forests to Indonesia's national and sub\national economies. The study lays the groundwork for more comprehensive and deeper assessments of Indonesia's forests to enable a more widespread recognition of the role that natural resources can play in enhancing the livelihoods of the rural poor in Indonesia and in assisting an overall green economy transition.

4. What is the role of forest in poverty alleviation ?

The Indonesia Green Economy Model is utilised to compare investments in forest preservation and sustainable forest management options, with the added benefits and avoided costs that would be derived from the successful implementation of such options. More precisely, the three main components of the analysis are described as follows:

a) **Added benefits:** the monetary valuation of economic, social and environmental benefits deriving from sustainable forest management, focusing on short-, medium- and long-term impacts across sectors and actors. These may include, for example, enhanced production

of non-timber forest products and higher agricultural productivity due to soil quality preservation.

b) **Avoided costs:** the estimation of potential costs that could be avoided as a result of the successful implementation of sustainable forest management policies and processes. For example, the avoided costs of flood damage are estimated and accounted within this category, as well as expenditure for water purification (related to water quality).

c) **Investments:** they refer to the allocation and/or reallocation of financial resources (e.g. under REDD+) to create enabling conditions for sustainable forest management in Indonesia including three regulating services, that are , soil erosion, carbon sequestration and storage, and water purification and availability.

5. What are the key findings of this study on the valuation of Indonesian Forests?

By valuing the benefits of forests and their services, the Government of Indonesia can promote a shift towards the recognition of the critical interdependencies between socio-economic development and forest conservation. The Ministry of Forestry divided the forest estate into four different categories, based on functions:

1) **Conservation Forests:** designated for conservation of plant and animal species.

2) **Protection Forests:** to serve life support systems and maintain regulating services provided by forests.

3) **Production Forests:** designated for producing forest products, including timber. Production Forest is subdivided into Permanent Production Forest and Limited Production Forest.

4) **Conversion Forest,** which is to be converted for other land uses.

In 2013, the total forest cover in land designated for other land uses increased from 8.63 million hectares in 2011 to more than 9 million hectares.This increased forest area is due in good part to the conversion of agricultural farmland to farm forestry on Java and the Eastern Islands. Since the cultivation of agricultural products like cassava and rice is labour-intensive and younger generations are increasingly moving to the large metropolises of Java, more households are planting fast growing trees on their lands, mainly for timber and pulp production. If these areas are of increasing importance to the provision of key ecosystem services, at present there are no regulatory frameworks that can encourage their sustainable management.

Another forest management practice that is supported by the Indonesian government is the formalisation of customary forest ownership by indigenous communities. Under this practice, the government recognises the rights of indigenous communities to own and manage their forests in accordance with their customary law. Such an approach is based on the acknowledgement of customary rights and the directive role that local/customary communities should play in sustainable forest management.

6.

The evidence of the green growth oriented thinking in Indonesia is reflected through Indonesia's deep engagement with the REDD+ mechanism and through the involvement of communities in forest management, which is demonstrated by the Community Plantation Forest (CPF) programme. Since 2007 Indonesia has been at the forefront of the global effort to promote REDD+ (*Reducing Emissions from Deforestation and Forest Degradation*), a mechanism which recognises and rewards reductions in emissions from deforestation and forest degradation, the role of conservation, sustainable management of forests and enhancement of forest carbon stocks. A valuation of natural capital can enhance the knowledge and ability to set priorities for programmes, policies, and actions so that new jobs in sustainable sectors are created, green industrial activities are identified and new and innovative economic expansion opportunities based in the natural capacities of a region are designed.

REDD+ technical support and financial investments further have a role to play in the pursuit of a green economy transition. Increasing local participation in forest management and promoting strategies for widespread private and public participation in conservation could lead to more effective protection of forest cover and Indonesia's biodiversity.

Such approaches based on better management of natural resources have the capacity to generate diverse opportunities for additional economic revenues, which could have beneficial impacts for economic growth and for poverty alleviation. They could also support Indonesia in achieving the proposed Sustainable Development Goals (SDGs), as 13 out of the 17 proposed SDG targets are directly or indirectly reliant on the condition of natural resources.

However, there are numerous challenges to overcome, most notably tenure insecurity, poor governance and weak law enforcement in forest areas. These challenges are exacerbated by the incomplete gazettement of Indonesia's forest zones and overlapping land claims, among other things.

Although fluctuations occurred during the timeframe considered, the amount of taxes collected in 2010 is approximately the same as in 2000. Conversely, there is a clear downward trend in the forest revenue share from total government revenue, indicative of the declining contribution of the timber trade in Indonesia's economy. Illegal logging can account for between 40 and 80 % of Indonesia's timber trade, costing the Government of Indonesia billions of dollars in revenue loss every year.

7.

Indonesia's forests, through Non Timber Forest Products (NTFPs) play an important role in the livelihoods of poor rural communities. For example, on average across Central Kalimantan, 76 percent of the incomes of rural households are derived from forests and ecosystem services. A development strategy seeking to alleviate poverty would be more effective if it recognises exactly which natural resources support the well-being of the poor on an everyday basis.

Across Indonesia, more than 74 percent of the poor depend on ecosystem services for their basic livelihoods. Depletion of these services would thus, have dramatic effects, whilst widening the national inequality gap. For instance, in East Nusa Tenggara, where 80 percent of the population is involved in the agricultural sector, a continued degradation of forests will deplete key regulating services for agriculture, which could particularly affect the rural poor within this province and reduce their resilience to any unexpected climate change impacts.

The FEVS underlines how these environmental, social and economic issues are deeply interlinked. While valuation of forest ecosystem services demonstrates the role of forests in promoting multiple branches of the economy, it also emphasizes the strong social implications of forest degradation and deforestation. As one domain affects the other, the FEVS seeks to highlight the intertwined dimensions to enable policy-makers to make more informed decisions.

8.

This study demonstrates that a Green Economy (GE) route, rather than 'Business as Usual' (BAU), would lead to a better management of forests, that would ultimately translates into an increase in production and revenues from the forestry sector, as shown in the example represented below. Three arguments support this conclusion :

- The upstream timber industry added more than USD 14 billion to the Indonesian economy in 2012 . This estimation excludes timber from illegal sources and is thus an underestimation of the true value of timber production. Not only would a further degradation of forest areas contribute to a decrease in this crucial source of income – without even mentioning the equally important employment dimension – but this would also engender a significant loss in tax revenue for the Indonesian economy. In order to ensure an increase, or simply maintain these important economic contributions, sustainable management of forests is necessary.
- Forestry employment is projected to decline until 2030 (about 15,000 job/year), driven by the intensive exploitation of forest stocks and the lack of interventions to support the emergence of certified production and sustainable practices. By contrast, under the Green Economy scenario up to 17,000 jobs could be created on average each year between 2014 and 2030, amounting to a total of 275,000 new jobs in formal forestry sector (65,000 from sustainable timber production and 210,000 from rubber and Non Timber Forest Products).
- NTFPs have significant economic potential for Indonesia as their production has considerably increased over the past decade. Overall, the medicinal plants industry and the essential oil industry are strongly anchored throughout the country. Indeed, whilst in 2011, the medicinal plants industry produced more than USD 1 billion worth of products, Indonesia is now the world's biggest producer of 8 types of essential oils. These economic contributions have the promising capability of developing in the near future, but this is subject to the state of Indonesian forests, and to how well they will be protected.
- The regulating services provided by forests are vital for the socio-economic well-being of many of Indonesia's provinces. For example, in Central Sulawesi, one hectare of forest prevents soil erosion equivalent to 6,538 kg/ha/year, which, also considering soil nutrient loss due to surface run-off, translates to an avoided cost of approximately USD 30 per hectare of forest in a year. This 'avoided cost' provides a significant argument in favour of increasing investments in forest protection, as failing to do so will diminish soil quality and considerably reduce agricultural yields. Specifically, this would not be coherent with the Regional Medium-Term Development Plan (RPJMD), which has the main objective of increasing economic growth through pro\poor economy schemes, based on the extensive utilisation of natural resources and agriculture.

Globally, these valuations of regulating services applied to five key provinces reveal that the economic value of soil erosion prevention in the provinces ranged from USD 2 million to 81 million per year; the economic value of carbon sequestration and storage ranged from USD 17 million to 97 million and USD 1.2 to 19 billion per year, respectively; and the economic value of water augmentation ranged from USD 435 million to 2.4 billion per year.

Generally speaking, sustainable management of forests would conserve the value of these assets, reducing administrative and fiscal costs at provincial levels, which could be required if these natural services are degraded and substitutes need to be instituted. Meanwhile, assuming a projected avoided deforestation of over 110,000 km² until 2030, it is estimated that the total cumulative investment required to reach this goal is close to USD 10 billion between 2015 and 2030. The annual investment required therefore slightly exceeds USD 600 million.

Overall, the local policies and regional development plans can only be effective in maintaining provinces' natural capital if the relevant stakeholders understand the value of services forests provide.