Natural Capital Valuation
for Ecosystem Service Across the Landscape of Sembilang-Dangku

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KELOLA SENDANG

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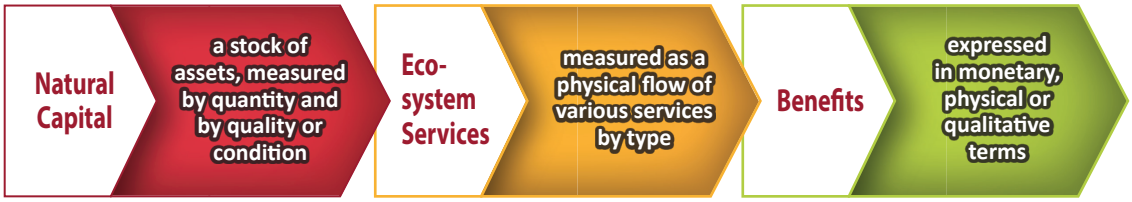
The landscape of Sembilang-Dangku has very high values in terms of climate change mitigation, biodiversity conservation, national and local economic development as well as local people livelihood. Analysis how natural capital concepts and tools can measure and communicate the benefits of Sembilang-Dangku landscape. And the application of a natural capital valuation to understand and promote the value of Sembilang-Dangku landscape, South Sumatra.

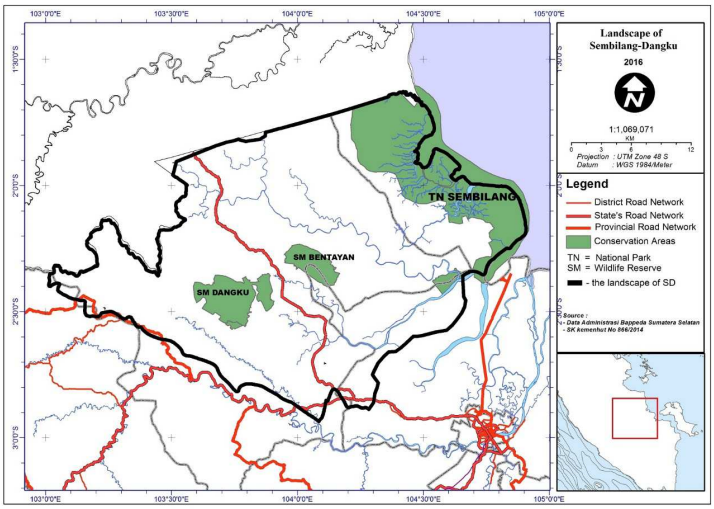
The Natural Capital Committee (2014), natural capital includes ecosystems, biodiversity and all abiotic resources like fuels and minerals. Natural environment as a capital asset, that is something that has the productive capacity to generate value, in terms of benefits that we derive from them. A common approach to understanding the provision of such benefits is the ecosystem services approach.



Method:

1. understand which natural capital assets are asked to analyze, and what benefits they produce and for whom
2. measure these benefits as well as costs of maintaining the quality and quantity of these assets to ensure their sustainable use over time
3. account for the costs and benefits to see how they change over time and whether our uses of the assets are indeed sustainable.

The analysis will only cover a landscape of Sembilang and Dangku, which covers part of Musi Banyuasin and Banyuasin districts. The landscape to the north and east of the Lalan River is predominantly peatland and mangroves including the Sembilang National Park, and is the priority area for protection in South Sumatra's peat and lowland eco regions.



The Sembilang-Dangku landscape

The benefits derived by the main ecosystem services will be evaluated, and would detail the outputs in either quantitative or qualitative terms, and where possible provide an indication of monetary value. Monetary value will be initially in IDR (Indonesian Rupiah), which is converted into USD (US Dollars) under current value changes.

ECOSYSTEM SERVICES AND THEIR CAPITAL VALUES

Previous study identified 9 ES (ecosystem services) – consisting of 14 sub-services – provided by the Sembilang-Dangku landscape, from which the provided service units are presented:

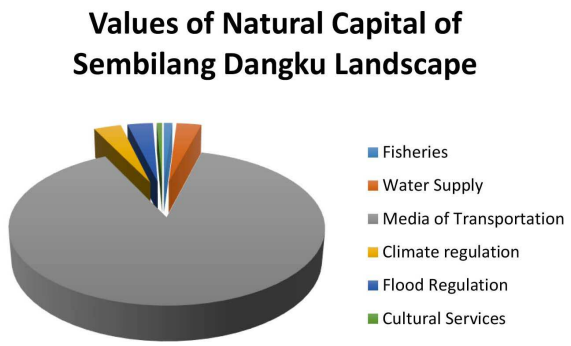
Service Categories	Description	Values (IDR)	(%)
A. PRIVISIONING SERVICES			
1. Traditional Agriculture			
a. Paddy production	Paddy field = 150,350 Ha; Production = 592,148 ton; Price = IDR 4,650/kg	2,753,488,200	0.46
b. Rubber production	Total rubber plantation area = 236,985 ha; Mature productive rubber plantation = 116,570 Ha; Production = 93,650 ton; Price = IDR 20,450/kg	1,915,142,500	0.32
c. Crop production (vegetables, fruits, etc.)	The total harvest of crops = 20,838 Ha; Production = 136,161ton; Price = IDR 8,250/kg	1,123,328,250	0.19
2. Intensive Agriculture			
a. Palm oil production	Total palm oil plantation = 389,876.00 Ha; Production = 1,711,844ton; Price = IDR 1,825/kg	3,124,115,300	0.52
	Approximate areas of oil palm = 307,358 ha; approximate dryland areas utilized for palm oil plantation = 17,330,22 ha; approximate areas of dryland utilized for palm oil plantation = 65,188.26 ha		

Service Categories	Description	Values (IDR)	(%)
3. Forest Harvesting			
a. Log production	Total areas = 52,430 Ha; Production = 419,400 m3; Price = IDR 212,500/m3	89,122,500,000	14.75
b. Pulp & paper materials	Total areas = 209,750 Ha; Production = 927,500 m3; Price = IDR 112,000/m3	103,880,000,000	17.20
	Approximate peat swamp areas utilized for HTI = 76,839.44 ha; approximate degraded areas for HTI = 41,031.86 ha; approximate dryland areas for HTI = 12,283.70 ha; approximate dryland and scrub areas for both HTI and log production = 114,674.63 ha; and approximate dryland forest for both HTI and log production = 17,330.22 ha		
4. Fisheries			
a. Marine fisheries	Total production = 57,461 ton; Price = IDR 19,500/kg	1,120,489,500	0.19
b. Fresh water fisheries (water bodies + ponds)	Total production = 51,688 ton; Price = IDR 29,000/kg	1,498,952,000	0.25
5. Water Supply			
	Drinking water: PDAM production = 6,324,543 m3; Price = IDR 2,300/m3; Total PDAM production = 6,324,543 m3; Price = IDR 1,150/m3	7,273,224,450	1.20
	Local people use wells, rivers, streams: 110,000 people; Daily needs = 22 m3 water/people/year; Price = IDR 1,150/m3	2,783,000,000	0.46
6. Media of Transportation			
	Total number of boats utilized = 5,061 units; 120 Working Days (WD); IDR 600,000 /WD	364,392,000,000	60.32
B. REGULATING SERVICES			
1. Climate regulation			
a. CO2 sequestration	Extent of peatland = 687,406 ha; An average peat depth of 1.5 m; Stored carbon of 0.31 ton CO2/m3; Approximate below ground carbon 3,196,437,900 ton CO2; Approximate above ground carbon in the landscape 116,256,957 ton; The total carbon in the landscape = 3,312,694,857 ton CO2; Price = USD 4/ton	13,250,779,428	2.19
2. Flood Regulation			
a. Peatland functioning	Flooding risk (of the total landscape area): Approx. 60%; Approx. 960,192 ha; Opportunity cost of flooding = IDR 10,220,000,000 (*this is the cost spent by the local governments for mitigating flood in the landscape*)	10,220,000,000	1.69
C. CULTURAL SERVICES			
1. Recreation/Education	Approx. 11,000 tourists; Spent IDR 1,500,000 per tourist per year	1,650,000,000	0.27
TOTAL VALUES		**604,107,019,628**	**100.00**

Values of Natural Capital of Sembilang Dangku Landscap

Overall, the capital values of Regulating Services contribute the highest portion (97.87% of the total capital values), which is followed by Provisioning Services (2.12 %) and very small Cultural Services (0.003%). The vast extent of peatland in the landscape has contributed the largest values of natural capital in the landscape, where it could promote the climate regulation. The peatland could certainly also function in controlling flood in the landscape. But the limited information on the opportunity cost of flood risk might have made the approximation undervalued.

From the Provisioning Services, the values of water (or river) in transportation have made a significant contribution to the natural capital of this landscape (1.79% of 2.12%). Forest harvesting is the next high contributor to the Provisioning Services. Agriculture practices (both traditional and intensive) do not seem contribute a significant value to the landscape, and yet they often pose damages to the ecosystem (e.g., forest clearing, fire, peat drainage, poisons, chemical pollution, etc.)



Summary of Values of Natural Capital of Sembilang Dangku Landscape

While biodiversity provision is intended to be the key benefit of the site, this particular benefit has not been fully captured in this study. However it is important to appreciate that some of this value is likely accounted for in the educational values. Although the full value may be difficult to express in monetary terms, it is still important to monitor and express this service in qualitative and quantitative terms, such as by trends in survey data, or by tracking important indicator species.

RECOMENDATION

Whilst this study has been limited to an assessment of the more significant and readily assessable benefits of the landscape, it is important to realize that there are further benefits that may need further investigation. For example, more work may capture some of the regulating benefits of biodiversity (e.g., *pollination services*). However, the real benefit in accounting for natural capital will be to monitor the health and diversity of wildlife in physical terms and on a regular basis.

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Proyek **KELOLA Sendang** adalah bentuk kemitraan antara publik, swasta dan masyarakat untuk mewujudkan pengelolaan lanskap yang berkelanjutan. Proyek ini merupakan bentuk dukungan bagi Pemerintah Provinsi Sumatera Selatan untuk mewujudkan visi pertumbuhan hijau (*green-growth*). Proyek bertujuan untuk mendorong kerjasama para pihak dalam menyeimbangkan kepentingan produksi dan konservasi melalui pengelolaan lanskap terpadu. Proyek memfasilitasi perencanaan, kerangka kerja dan aksi kolaboratif untuk melestarikan keanekaragaman hayati dan konservasi hutan, mengembangkan praktik terbaik ramah lingkungan bagi pengelola lahan dari sektor publik dan swasta, serta memperkuat penghidupan masyarakat. Proyek akan berkontribusi bagi upaya mengatasi masalah lingkungan hidup seperti kebakaran hutan dan lahan, degradasi hutan dan keanekaragaman hayati, kerusakan lahan gambut serta mendorong penurunan emisi gas rumah kaca.

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