

A photograph of a mangrove forest at sunset. The sky is filled with large, dark clouds, and the sun is low on the horizon, casting a warm orange glow. The water is calm, reflecting the sky and the silhouettes of the mangrove trees. The trees have thick, gnarled roots that are partially submerged in the water. The overall scene is serene and natural.

Mangrove protection in Indonesia

A Global Independent Surveillance mechanism as foundation for PES

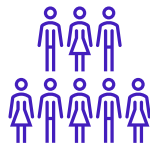
Final Presentation – Group Nature

20th July 2022
Environmental Economics

Professor Takahiro Tsuge

Michael Murawski, Natasha Gorong

Indonesia



280 mn inhabitants

56.4% urban



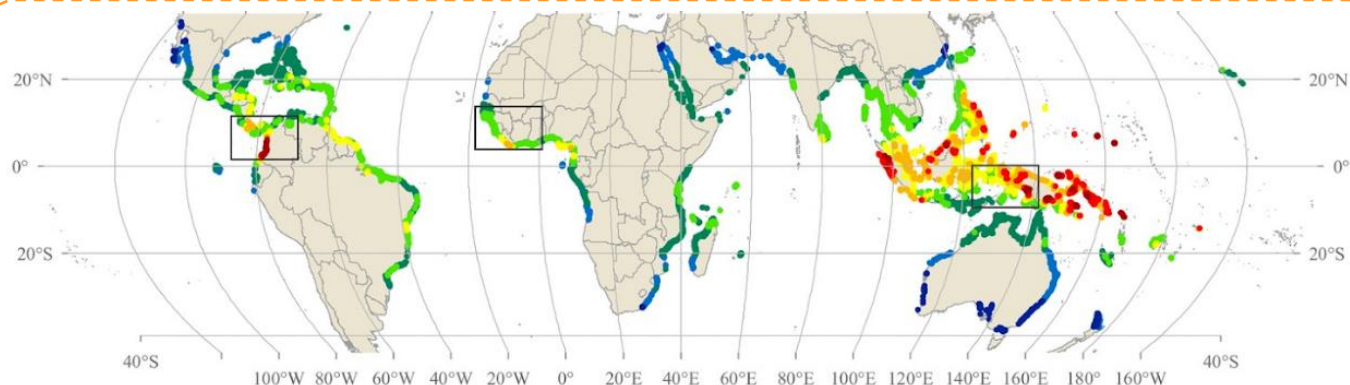
3,869.59 USD
GDP per capita



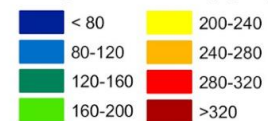
1,811,570 sq km
land size



4th Forest-rich country
1st mangrove-rich



Aboveground Biomass (Mg/ha)



Source: Hutchison et al. (2014)

Mangrove Ecosystem Services



Water purification



Carbon sequestration



Flooding protection



Sediment stabilization
and soil retention

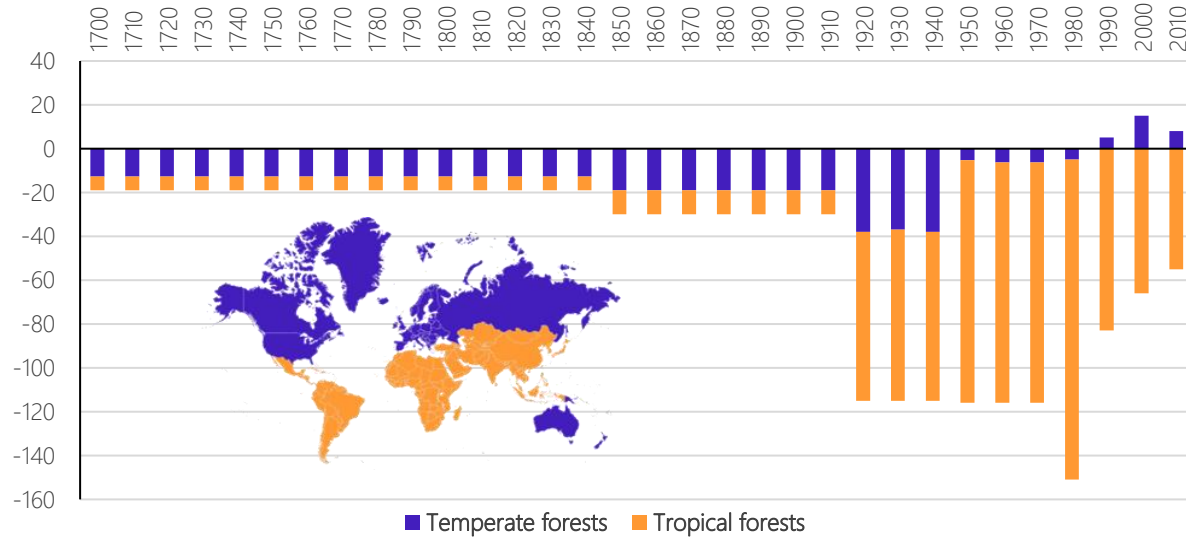


USD 15-60k p.a.
per hectare

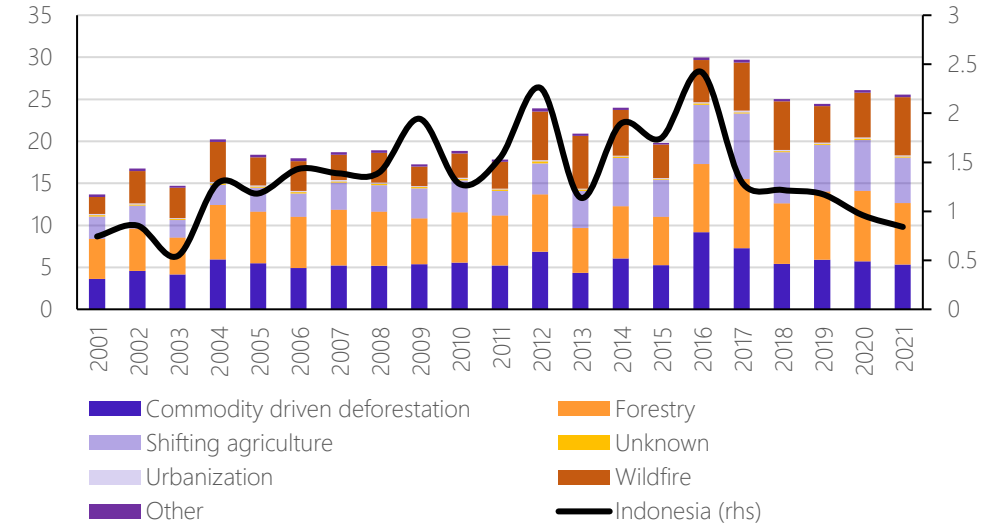
(WB, 2022)

Conversion of mangroves

Global Net Forest Loss in million ha - 1700 to 2020



Global Forest Loss by driver in million ha - 2001 to 2021



Source: Ritchie, Roser, Global Forest Watch

Mangrove loss globally in ha

	Mangrove area (1000 ha)				Annual change (1000 ha/yr)		
	1990	2000	2010	2020	(1990 - 2000)	(2000 - 2010)	(2010 - 2020)
Asia	6331	6320	5928	5545	-1.1	-39.2	-38.3
East Asia	24	22	25	32	-0.2	0.3	0.7
Southeast Asia	6117	6108	5713	5330	-0.9	-39.5	-38.3
Central Asia	190	190	190	184	0	0	-0.6
Africa	3398	3332	3264	3240	-6.6	-6.8	-2.4
Europe	0	0	0	0	0	0	0
North and Central America	2431	2439	2447	2552	0.8	0.8	10.5
South America	2152	2050	1976	2124	-10.2	-7.4	14.8
Oceania	1447	1150	1314	1255	-29.7	16.4	-5.9
World	15759	15291	14929	14716	-46.8	-36.2	-21.3

Selected regions with highest mangrove losses in ha

	2000	2020	Change
Indonesia	2,930,352	2,736,985	- 193,367
East Kalimantan	242,670	203,105	- 39,565
North Kalimantan	192,192	153,240	- 38,952
South Sumatra	166,199	142,681	- 23,518
West Kalimantan	123,564	113,271	- 10,293
Riau	153,722	143,596	- 10,126

Source: FAO (2020), Basyuni et al. (2022)

Mangrove Conservation in Indonesia



Governmental Challenges

Overlapping responsibilities as
source of complication

Ineffective existing policies

Corruption



Key Stakeholders

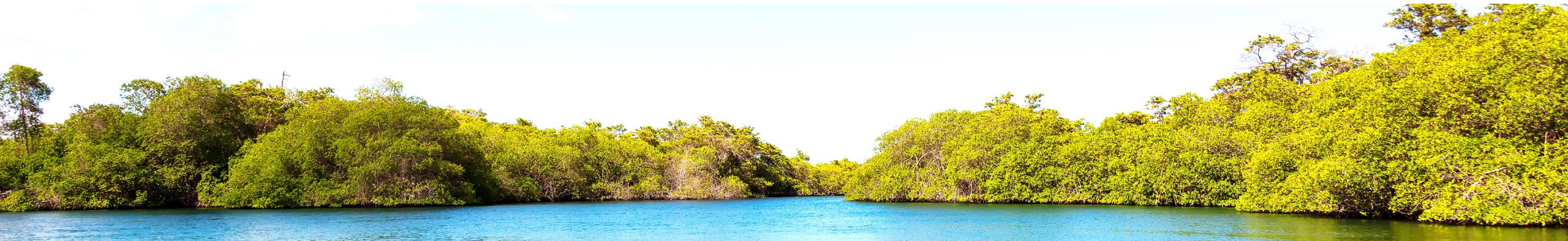
Inclusion of coastal
communities needed

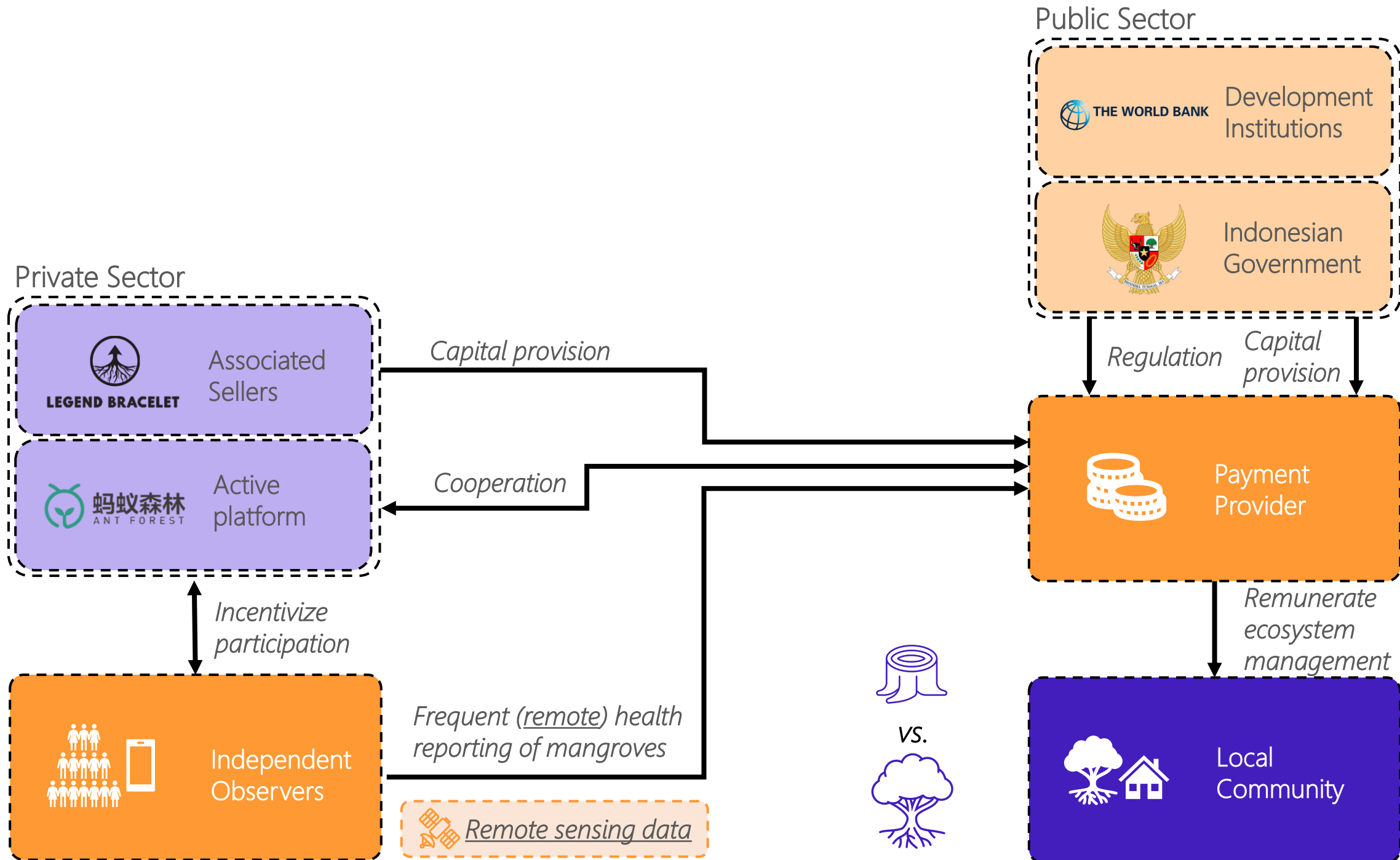


Financial Incentives

Provision of alternative
income to foster participation

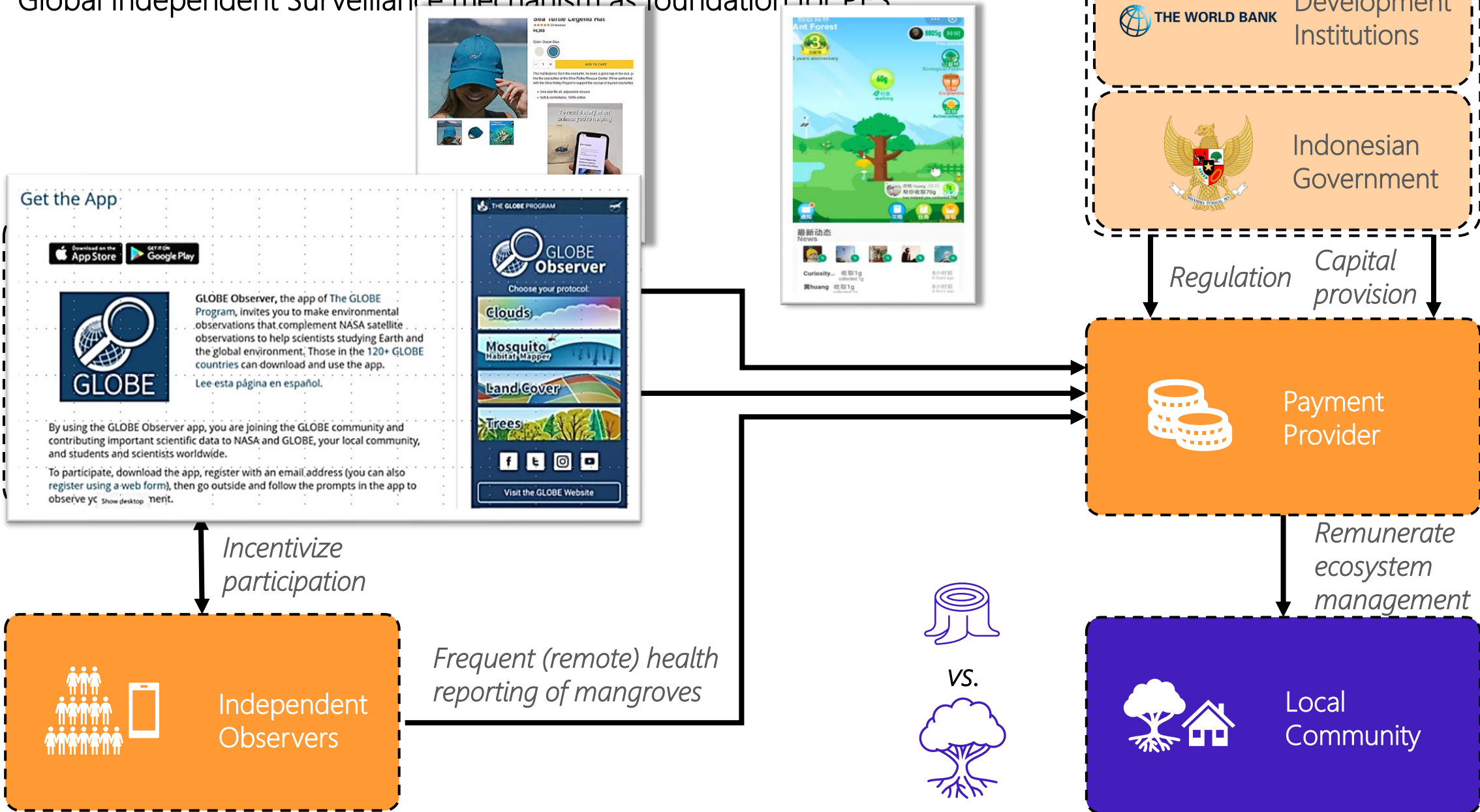
Increase chances of long-term
effectiveness



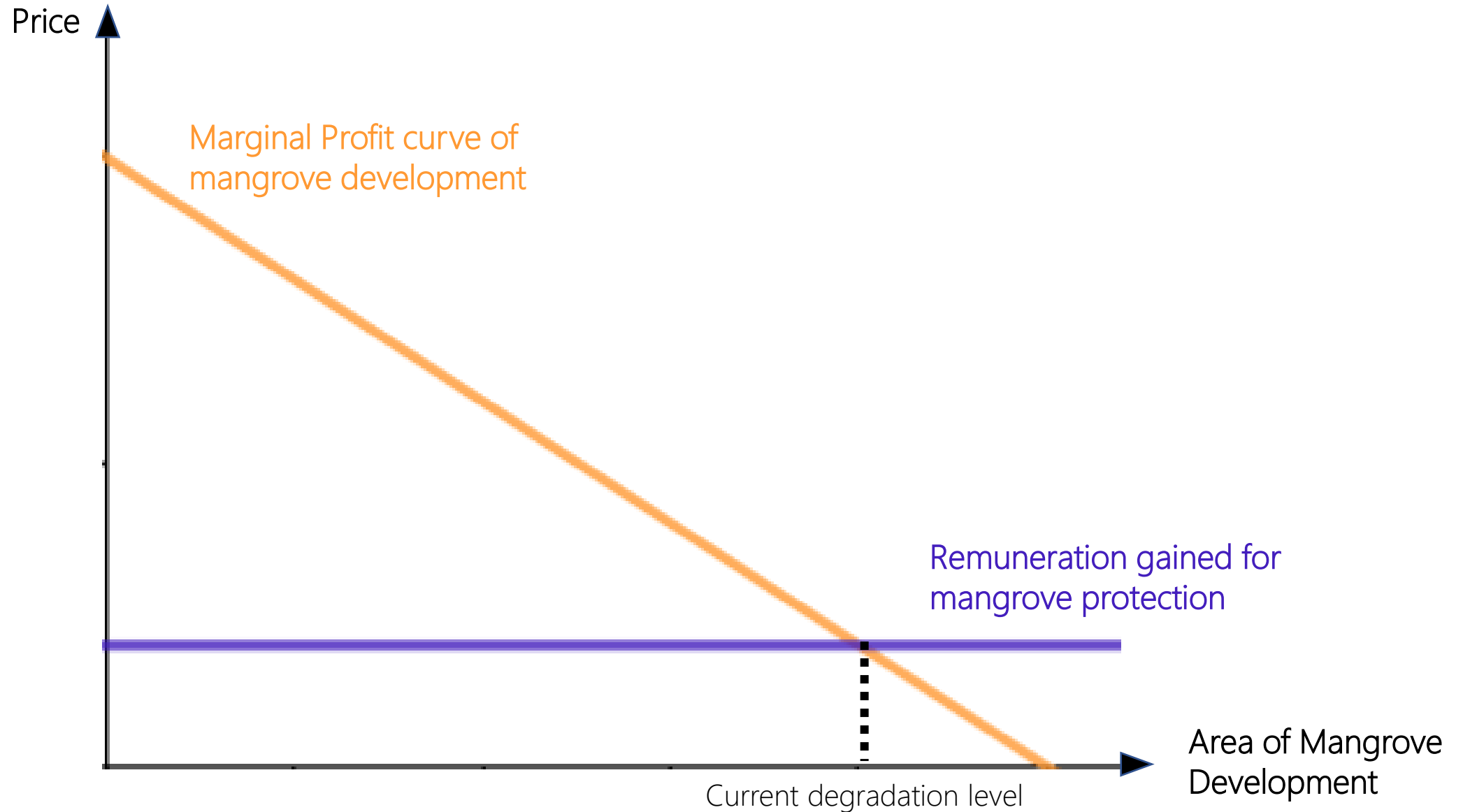


Proposed Policy Mechanism

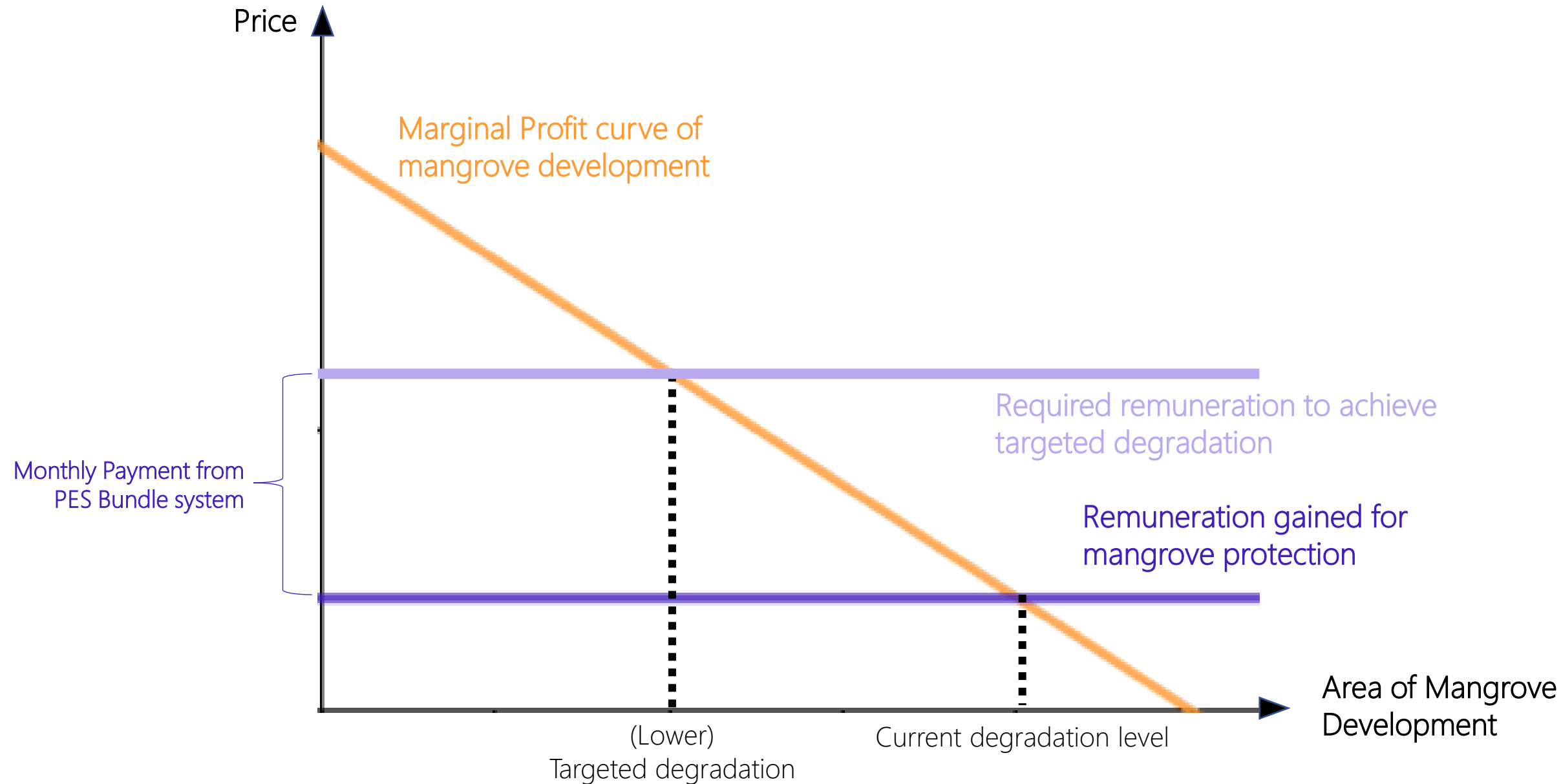
Global Independent Surveillance mechanism as foundation for PES



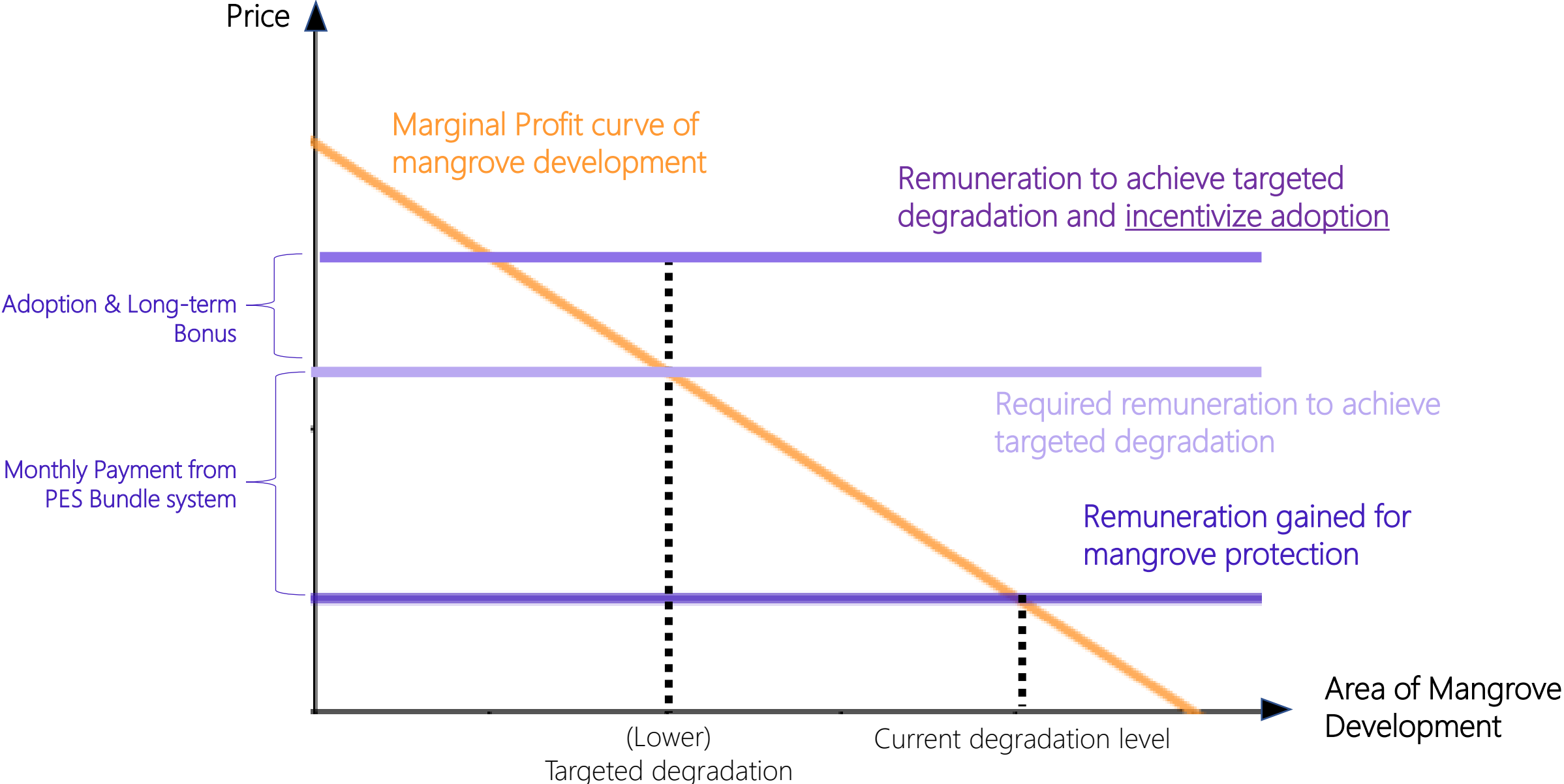
Proposed Policy Mechanism



Proposed Policy Mechanism



Proposed Policy Mechanism



Conclusion

Thank you for your attention!

Any comment, question or criticism would be highly appreciated!

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<https://pixabay.com/photo/>

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Hannah Ritchie and Max Roser

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Basyuni, M., Sasmito, S. D., Analuddin, K., Ulqodry, T. Z., Saragi-Sasmito, M. F., Eddy, S., & Milantara, N. (2022). Mangrove Biodiversity, Conservation and Roles for Livelihoods in Indonesia. In *Mangroves: Biodiversity, Livelihoods and Conservation* (pp. 397-445). Springer, Singapore.

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Picture Source: <https://www.canva.com/media/MABVA59fR7o>

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Ant Forest: 500 million yuan will be invested to plant 500 million trees in the next five years. Can get online: <http://news.mydrivers.com/1/569/569442.htm>.