

Cost Analysis for the Implementation of LUCF Mitigation toward NDC Target in Indonesia

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INTRODUCTION

- According to Indonesia's Enhanced NDC, the Government of Indonesia committed to reducing its emission unconditionally by 31% and conditionally up to 43% from the BAU level in 2030.
- The share of LUCF sector is expected to reach around 60% of the target, with a great contribution from carbon rich ecosystems (e.g., peatlands). Considering the significant proportion, having a reliable cost information for the LUCF sector become a necessity.
- Such information could also identify which mitigation options that are more likely to meet the target with the least cost, while also maintaining the essential environmental services and production objectives in maximizing economic and the social benefits.

METHOD

- This study used the Comprehensive Mitigation Assessment Process (COMAP) model to assess the cost-effectiveness of investment cost and life cycle cost (per ha and ton of C unit) of mitigation options.
- Mitigation options in this study have been set to consistently follow LUCF mitigation activities as stated in the official document of Indonesia's NDC; thus, covering a similar implementation timeframe from 2013 to 2030.
- This study assess the cost-effectiveness of several LUCF mitigation options by taking into account the direct (e.g., planting, maintenance, etc.), indirect (e.g., retribution, administrative obligations, etc.), and transaction cost (e.g., environmental impact assessment, marking concessionaire boundary, etc.) to estimate the total cost for the national implementation to meet both unconditional and conditional NDC targets.

CONCLUSIONS

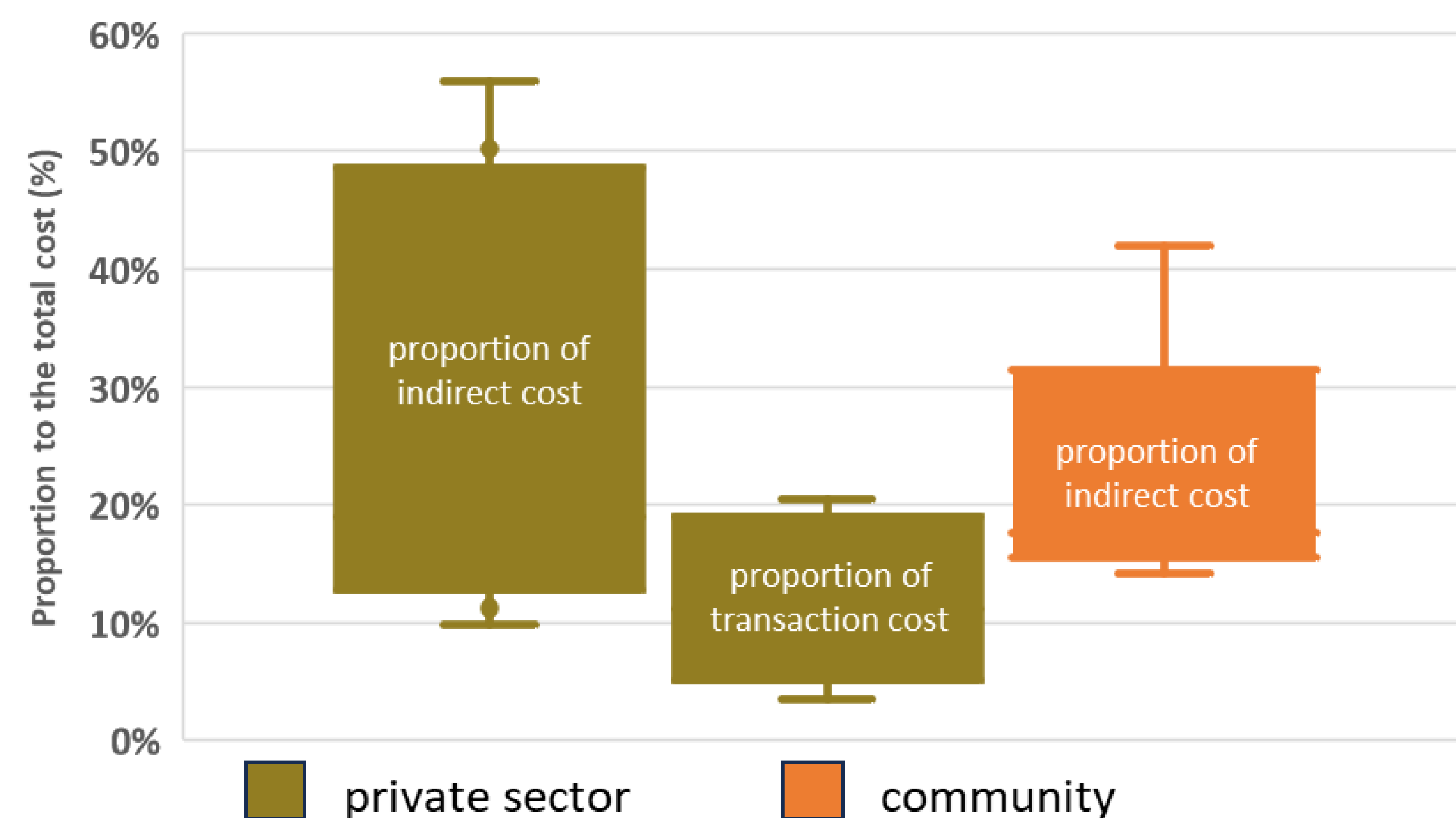
Mitigation cost for the LUCF sectors ranged from USD 10 to almost USD 2,000 per ha. The most cost-effective options are the activities intend for forest conservation and peatland management. This study found a considerably high indirect and transaction costs burdened to the private sector, which potentially be a main barrier for the private to accelerate the plantation area in achieving the NDC target. Thus, incentive schemes for cutting transaction costs are required to increase the participation of non-party actors towards the NDC target. To achieve the unconditional target, the total cost required for investment and one cycle expenses are USD 10,388 million and USD 25,517 million, respectively, which 39% of it expected to be provided by private sectors, while 61% by the state budget. Additional costs from international support required for investment and life cycle cost to achieve bolder commitment under the CM2 scenario amounted to USD 2,764 million and USD 6,062 million, respectively.

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RESULTS AND DISCUSSION

Proportion of the indirect and transaction cost to total mitigation cost



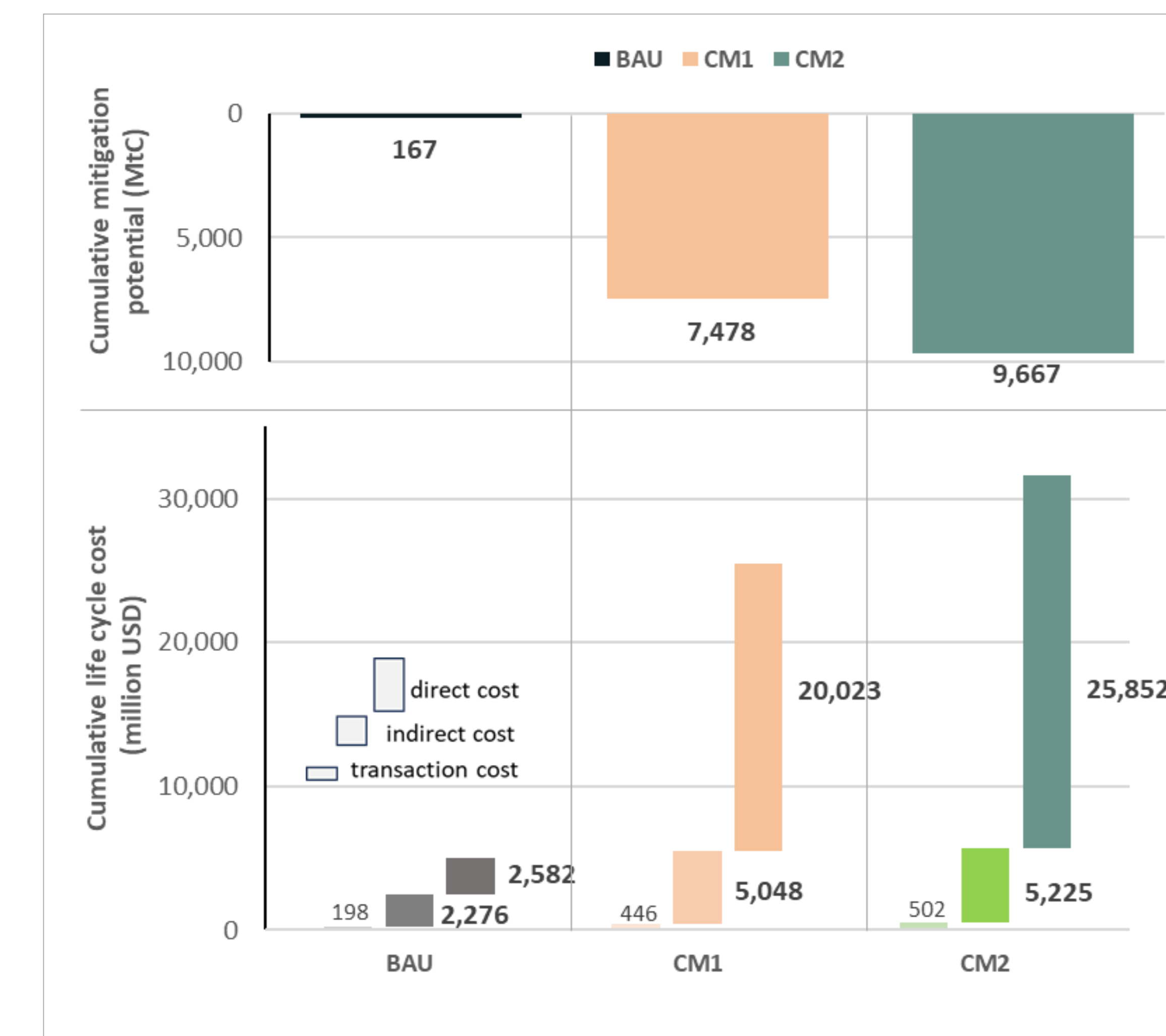
- On average, the portion of indirect and transaction cost for the company accounted for approximately 28% and 11% from the total life cycle cost.
- The highest indirect and transaction cost was found in reforestation mitigation activity with rotation/harvesting system (e.g., timber plantation).

Mitigation cost for each LUCF mitigation activities

No	Mitigation activities	Actor	Life cycle cost	
			USD/ha	USD/tC
1.	Reforestation in mineral land	Private sector	1,202 - 1,992	14 - 162
		Community	215 - 430	4 - 121
2.	Reforestation in peatland (<i>paludiculture</i>)	Community	513 - 636	0.91 - 1.20
3.	Improved peat water management		10 - 48	0.05 - 0.33
4.	Rehabilitation in mineral land	Private sector	340 - 375	4 - 19
		Community	65 - 81	0.9 - 15.6
5.	Peatland restoration	Private sector	584 - 670	2.4 - 2.5
		Community	360 - 380	1.5 - 1.6
6.	Enhanced Natural Regeneration in mineral		190	6.5
7.	Enhanced Natural Regeneration in peatland		538	3.3
8.	Forest saved from degradation		772 - 1,020	0.7 - 6.1
9.	Forest saved from deforestation		817 - 1,047	1.1 - 10.3

- In USD/ton C unit, the indirect and transaction cost made a clear difference to the mitigation impact, of which excluding formal transaction costs will increase the attainable emission reduction.
- This study found that the effort to conserve natural forests considered to be more cost-effective (in the USD/ton C unit) rather than reforesting the critical land.
- In general, the LUCF mitigation cost we obtain in this study was higher than the other studies for regional and global assessment.

How many dollars needed in total?



- The total cost required for investment and life cycle expenses for unconditional NDC are USD 10,388 million and USD 25,517 million, respectively.
- Of the total life cycle cost required for CM1, 39% of it expected to be provided by private sectors, while 61% by the state and public budget.

