Defining and quantifying urban natural climate solutions for Southeast Asia

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1 INTRODUCTION
• Natural climate solutions (NCS) have been estimated to potentially contribute much climate mitigation needed by 2030
• However, past research largely quantify application in rural areas, or on the level of individual cities for select pathways
• Potential for urban application of NCS is diverse, but there is no clear definition yet

What defines urban natural climate solutions?
How can we quantify the mitigation potential of urban NCS?

2 METHODS
1. Two-step literature review to define urban NCS
2. Classifying urban NCS interventions meeting definition into discrete pathways
3. Quantification methods for each pathway adapted from existing methodologies
4. Methods applied using geospatial analyses to four cities in Southeast Asia – Singapore, Kuala Lumpur, Bangkok, & Jakarta

3 DEFINITION OF URBAN NCS
1. A suite of mitigation pathways in cities that generate climate change mitigation outcomes.
2. Each urban NCS mitigation pathway is a quantifiable method of achieving climate change mitigation outcomes through types of actions directly and/or indirectly increasing carbon sequestration in biomass and/or avoiding greenhouse gas emissions.
3. These types of actions consist of both the protection, restoration and intensification of natural habitat and anthropogenic interventions that are inspired or supported by nature.

4.1 DIRECT PATHWAYS
1. Existing Habitat Sequestration
2. Avoided Biomass Loss
3. Improved Habitat Sequestration

4.2 INDIRECT PATHWAYS
1. Avoided Space Cooling Emissions
2. Avoided Concrete Emissions
3. Avoided Road Transport Emissions
4. Avoided Water Treatment Emissions

4 KEY FINDINGS
• Total maximum climate mitigation potential for the four cities calculated to be 10.8±4 Tg CO2e yr⁻¹ at a 2030 reference year
• This translates to a 7.1±1% potential reduction in combined annual emissions
• Indirect pathways found to contribute nearly two-thirds of total maximum mitigation potential – indicating that current estimations of NCS potential could be severe underestimations of true potential
• A large proportion of mitigation potential was derived from pathways that include interventions not traditionally defined as ‘natural’ (e.g., bioconcrete)

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