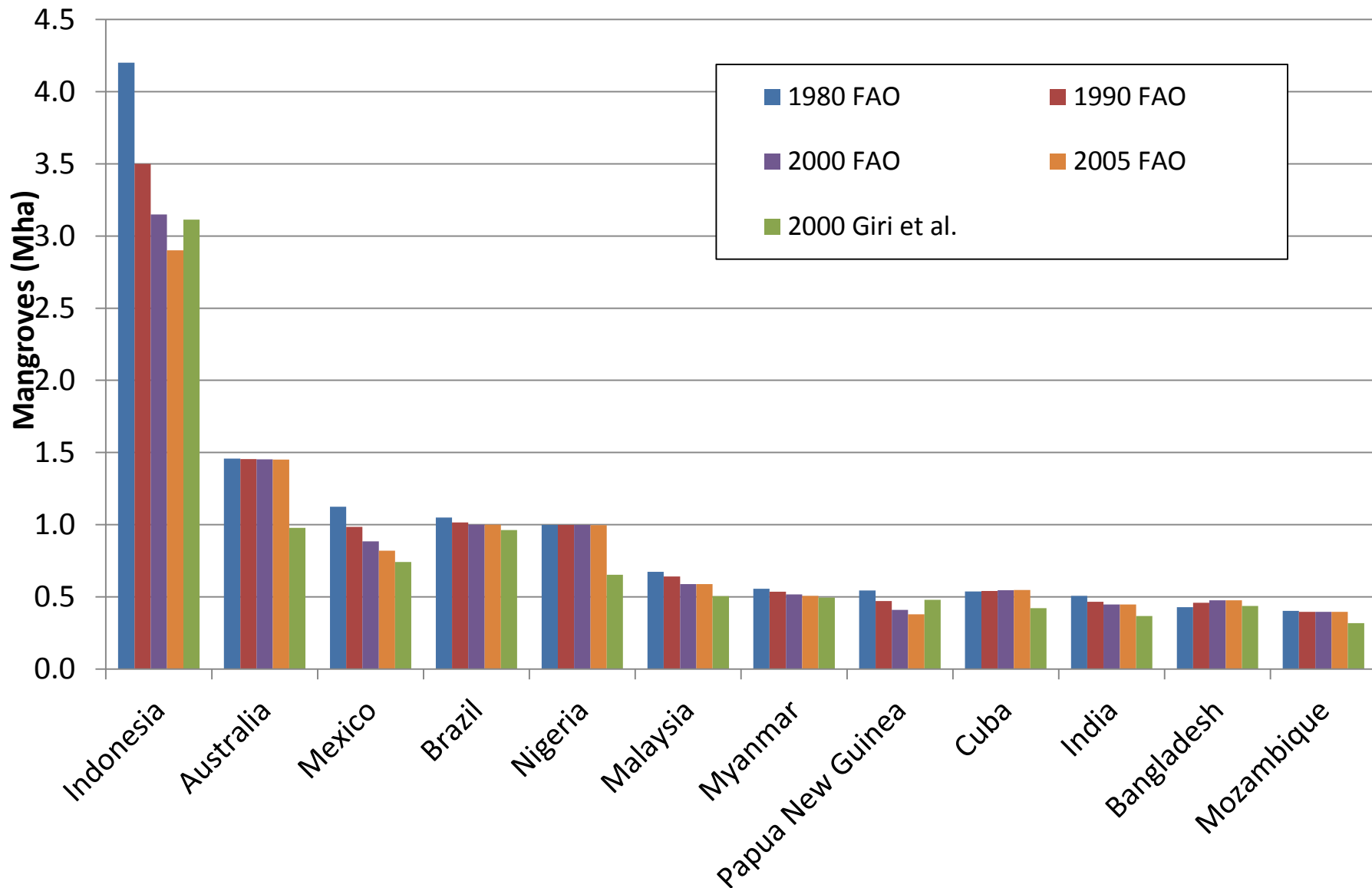




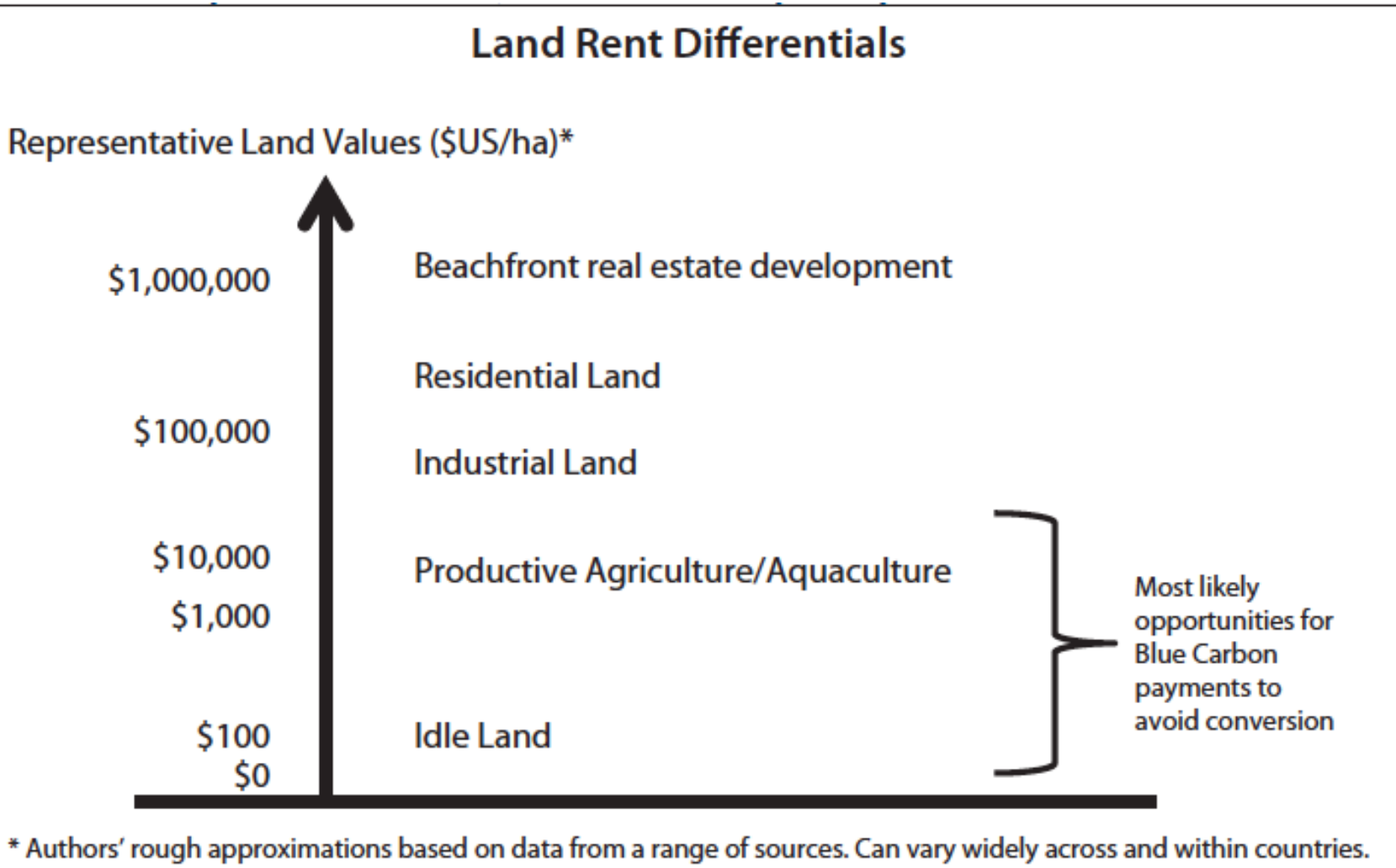
The Economics of Blue Carbon

David Gordon
Nicholas Institute for Environmental Policy Solutions
Duke University, USA
06 June 2012
Orlando, Florida



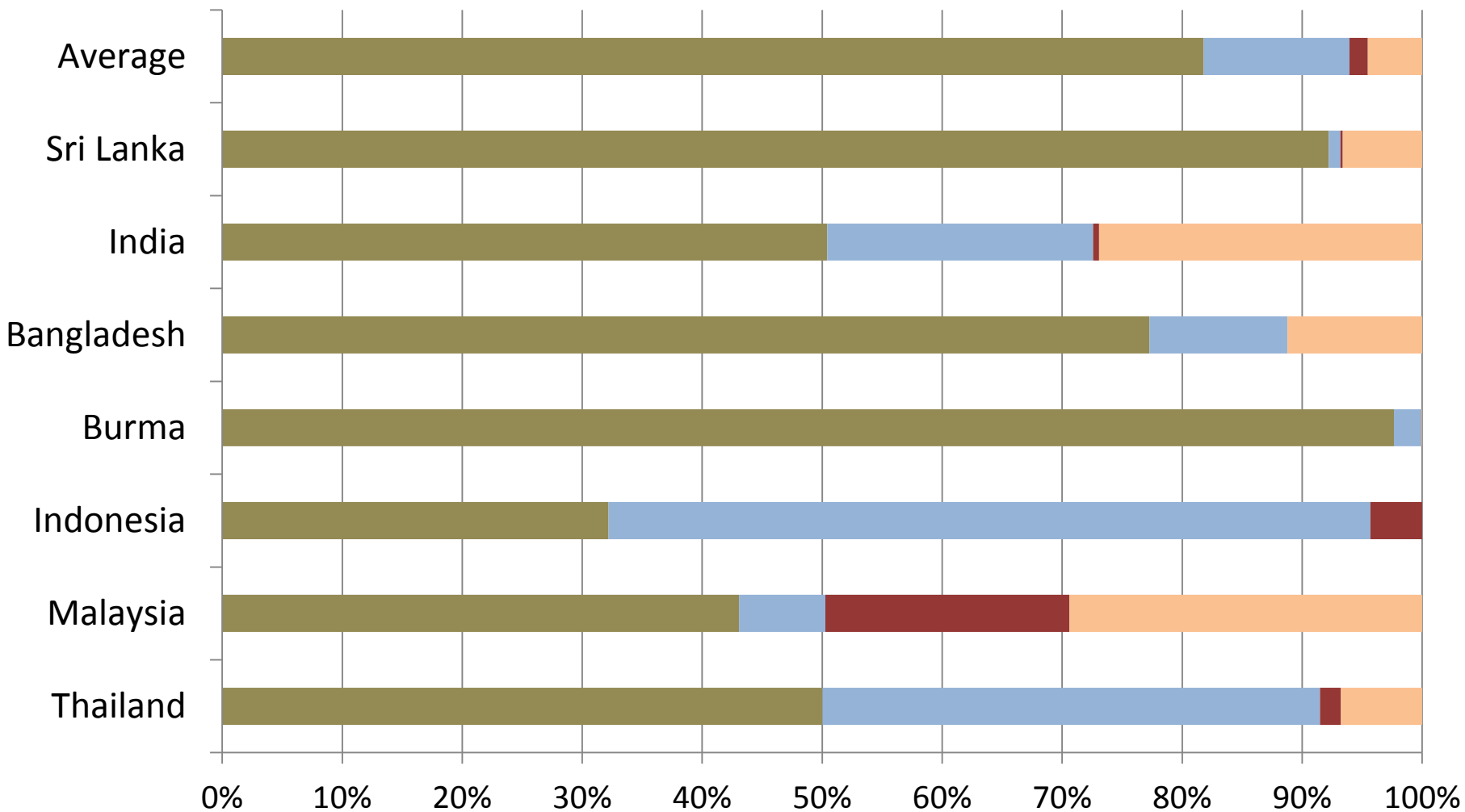


Opportunity Cost



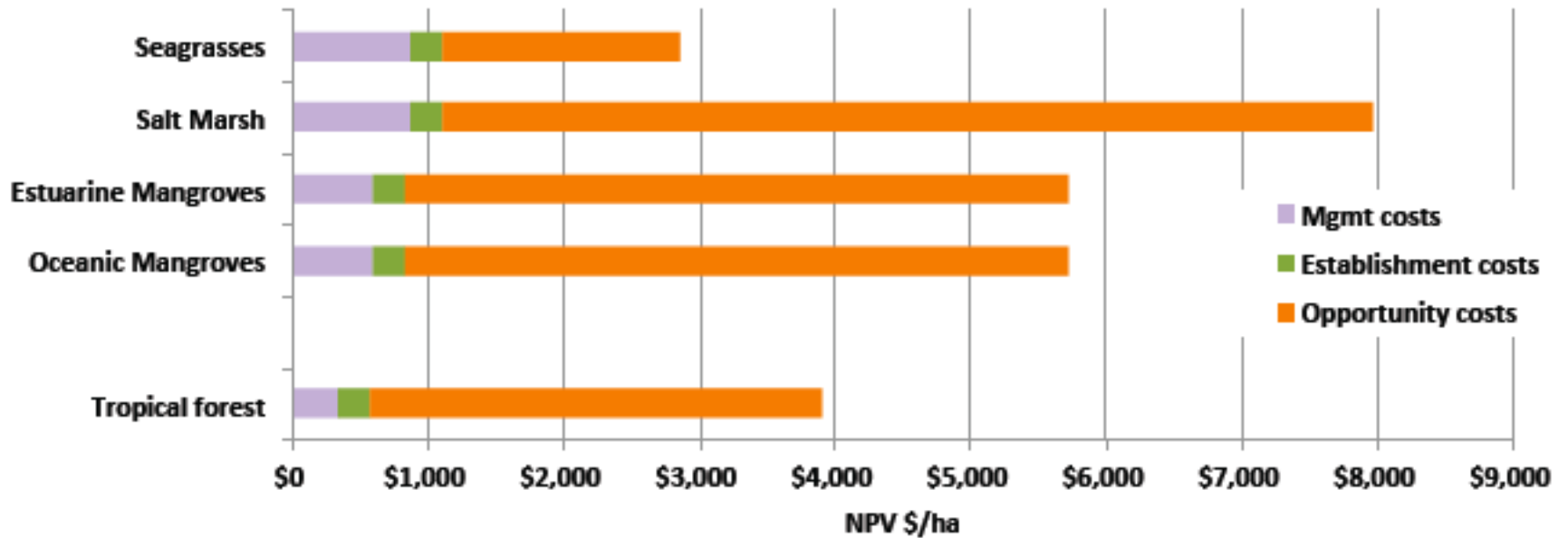


■ Agriculture ■ Aquaculture ■ Urban development ■ Other





Cost of Protection





Paying for Protection

Markets

Financing



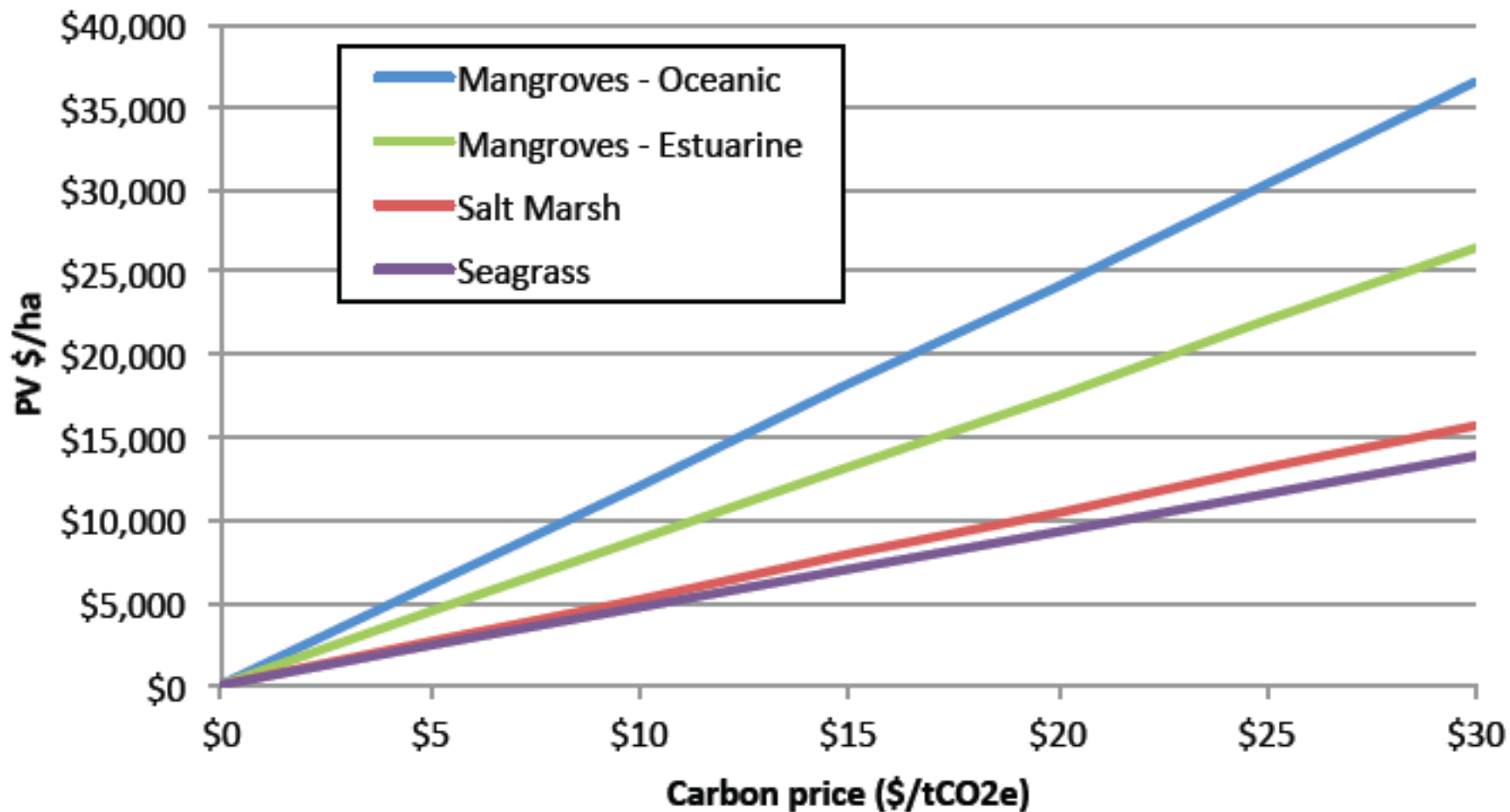
What May Be Eligible for Crediting?

Potential Credit Source	Time Period	Ecosystems
Avoided Loss of Sequestration Flux	Perpetuity*	Seagrasses Tidal Salt Marshes Mangroves
Avoided Emissions from Soil Carbon	Several Years to Decades	Seagrasses Tidal Salt Marshes Mangroves
Avoided Emissions from Biomass	Immediate	Mangroves

* Based on input from science team that blue carbon systems continue to sequester without saturation

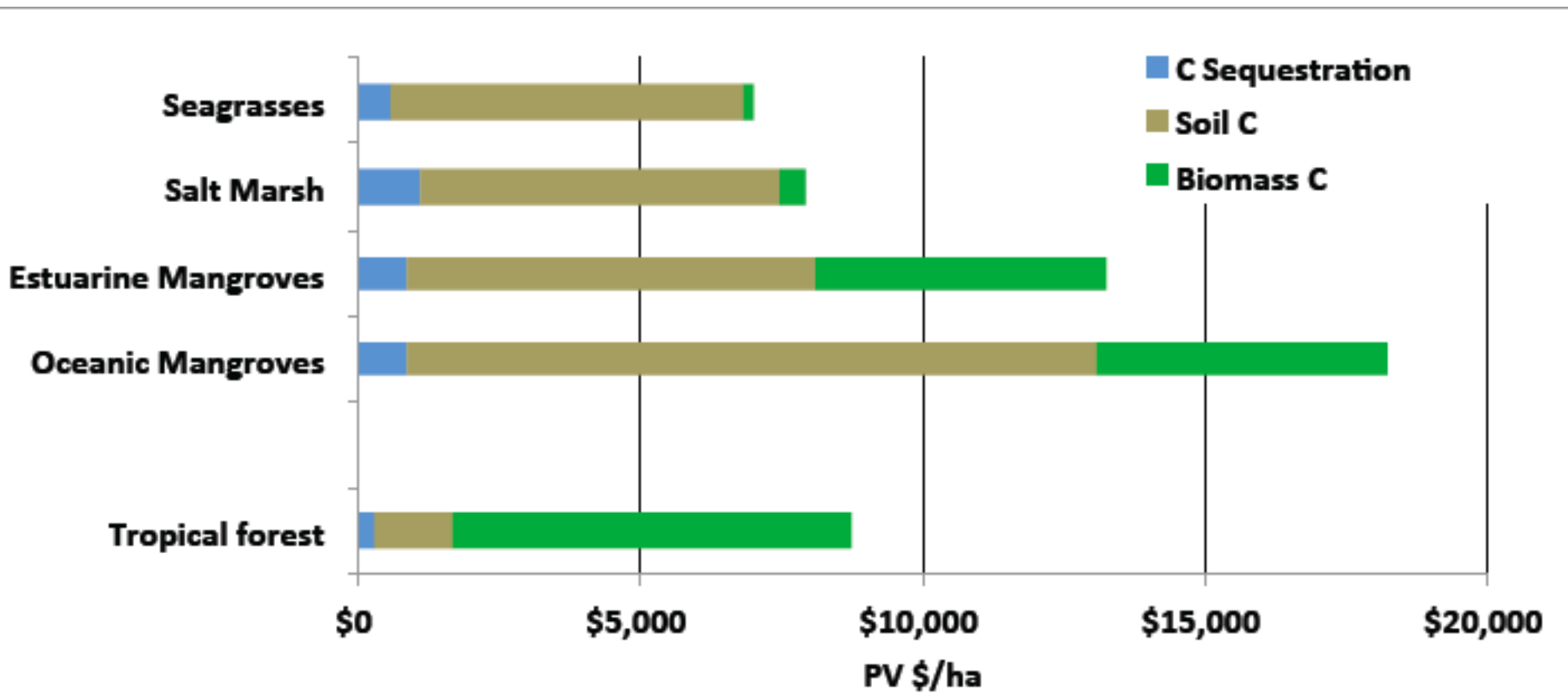


Gross Financial Returns





Potential Carbon-Credit Values

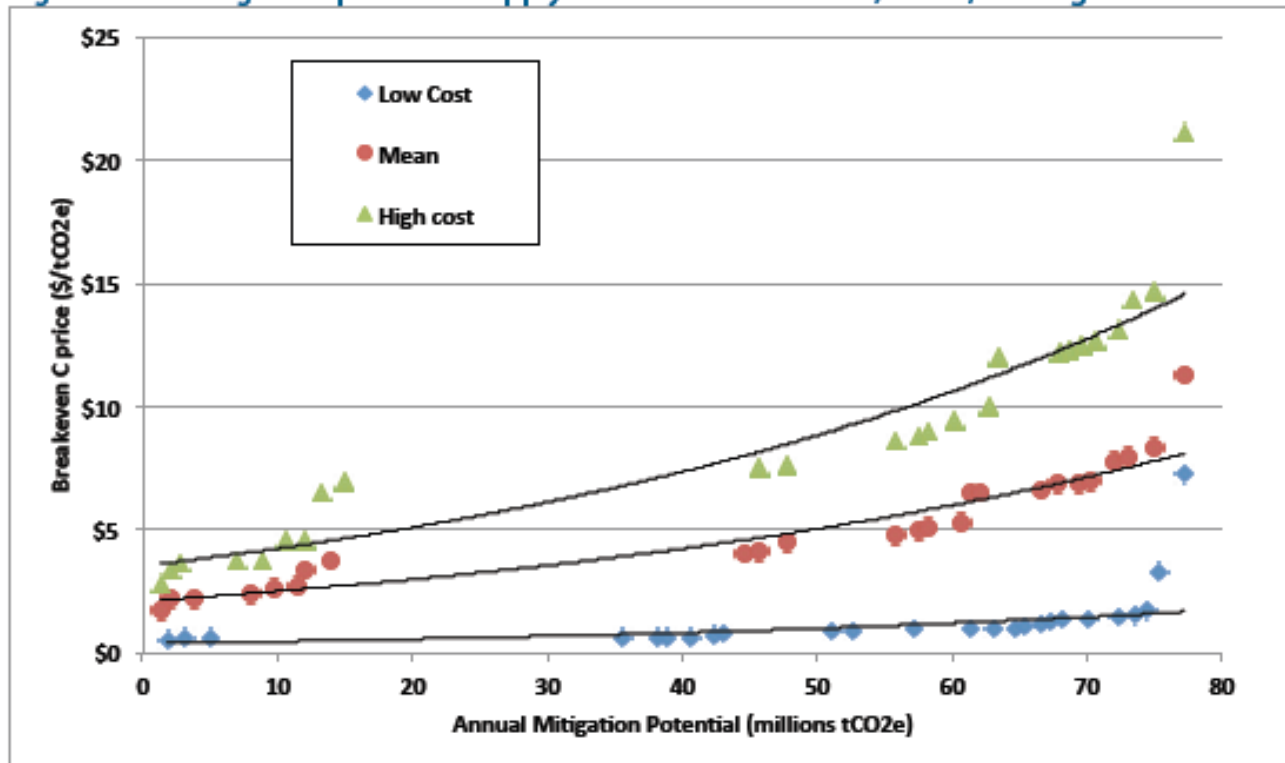


Source: Authors:



Global supply potential at different prices

Figure ES-1. Mitigation-potential supply functions for low-cost, mean, and high-cost scenarios.





Financing Blue Carbon: Markets Cost Money

Planning and Institutional Capacity	\$1.6 billion
Pilots and Projects	\$234 million
Verified Emissions Reductions	~ \$97 million in credits sold



○ Low Cost
High Risk

○ Add
financing
to build
capacity

○ Develop
market for
payment
flows



Future of Blue Carbon Economics

Incorporation in
existing
investments

Inclusion in
future mitigation
agreements

Competitiveness

Other reasons to
protect



Keep Up With Blue Carbon Policy

NICHOLAS INSTITUTE REPORT

Green Payments for Blue Carbon
Economic Incentives for Protecting Threatened Coastal Habitats

Brian C. Murray¹
Linwood Pendleton²
W. Aaron Jenkins³
Samantha Siffert⁴

¹Director, Economic Analysis, Nicholas Institute for Environmental Policy Solutions, Duke University
²Director, Oceans and Coastal Policy, Nicholas Institute
³Associate in Research, Economic Analysis, Nicholas Institute
⁴Policy Research Associate, Nicholas Institute

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Financing Options for Blue Carbon
Opportunities and Lessons from the REDD+ Experience

David Gordon¹
Brian C. Murray²
Linwood Pendleton³
Britta Victoria⁴

¹Associate in Research, Nicholas Institute for Environmental Policy Solutions, Duke University
²Director for Economic Analysis, Nicholas Institute for Environmental Policy Solutions, Research Professor, Nicholas Institute for Environmental Policy Solutions, Duke University
³Director, Oceans and Coastal Program, Nicholas Institute for Environmental Policy Solutions, Duke University
⁴Graduate Student, Nicholas School of the Environment, Duke University

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State of the Science on Coastal Blue Carbon
A Summary for Policy Makers

Samantha Siffert¹
Linwood Pendleton²
Brian C. Murray³

¹Policy Research Associate, Nicholas Institute for Environmental Policy Solutions, Duke University
²Director, Oceans and Coastal Policy, Nicholas Institute, Acting Chief Economist, Program Planning & Integration, Nicholas Oceans and Atmosphere Administration
³Director, Economic Analysis, Nicholas Institute, Research Professor, Nicholas School of the Environment, Duke University

May 2011

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nicholasinstitute.duke.edu

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<http://nicholasinstitute.duke.edu/oceans/blue-carbon>



Brian Murray

Email: brian.murray@duke.edu

Linwood Pendleton

Email: linwood.pendleton@duke.edu

David Gordon

Email: david.r.gordon@duke.edu



ADDITIONAL SLIDES



$$(1) \quad \textit{GHG Benefit Flux}_{it} = \textit{CS}_{it} + \textit{AvCO2}_{it} - \textit{M}_{it}$$

$$(2) \quad \textit{Blue Carbon value}_i = \sum_{t=0}^n \frac{\textit{GHG Benefit Flux}_{it} * \textit{Price}(t\textit{CO2eq})_t}{(1 + d)^t}$$

$$(3) \quad \textit{Blue Carbon value}_i > \textit{Protection costs}_i + \textit{Opportunity costs}_i$$



Net Benefits of Blue Carbon: mangroves

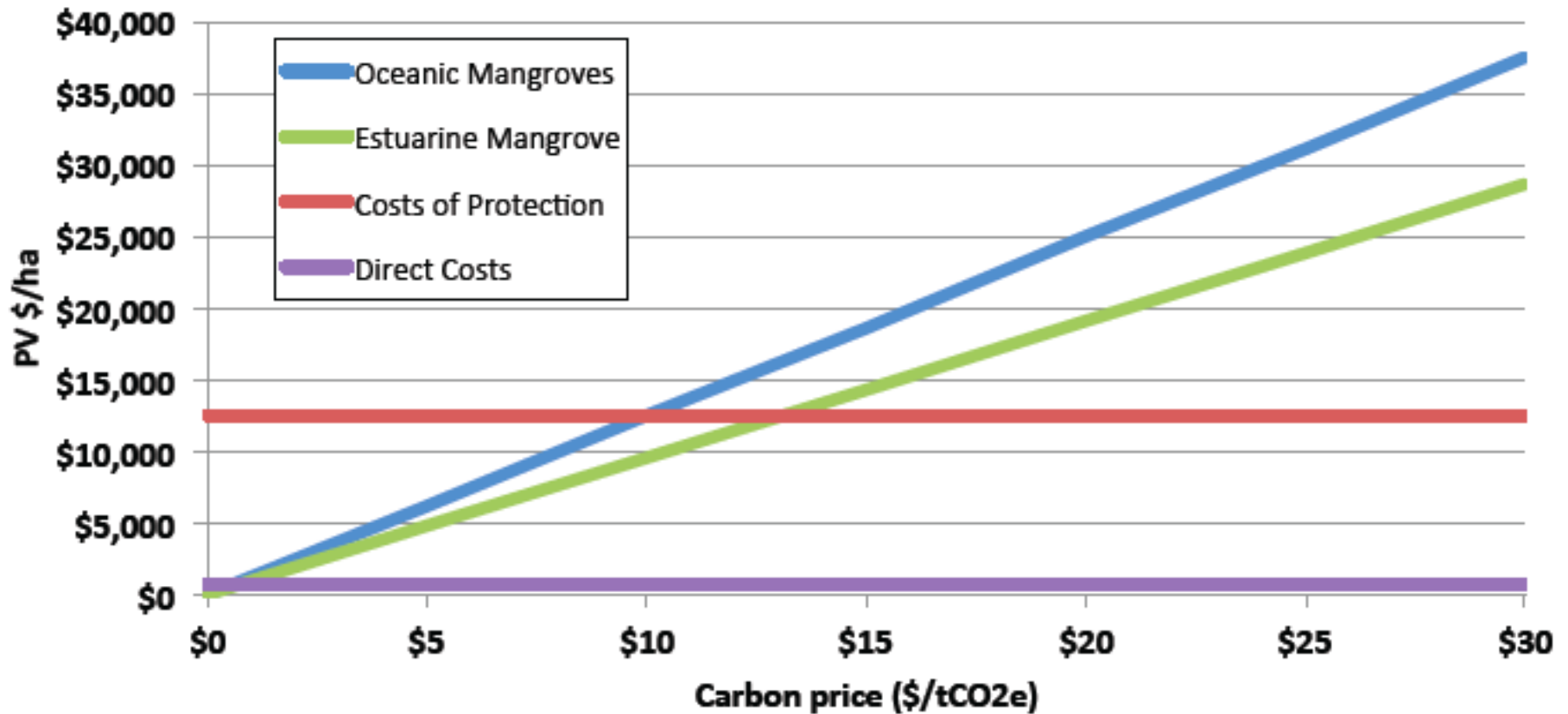


Table 6. Top 25 mangrove countries by break-even carbon price (\$/t CO₂e). Mitigation potential (t CO₂e/yr) is discounted to the present with a 10% rate as well as scaled down to represent only lands at risk from conversion to agriculture, aquaculture, or wood harvests.

Country	Break-even C price, avg cost	Discounted mangrove mitigation potential	Cumulative mangrove mitigation potential	Annual mitigation revenue potential, \$/yr @\$15/t CO ₂	Total mangrove area, 2005 (ha)	Annual Revenue potential (\$/ha)
Senegal	\$1.70	1,342,843	1,342,843	\$22,380,714	115,000	\$194.61
Cambodia	\$2.14	692,276	2,035,119	\$11,537,939	69,200	\$166.73
Guinea-Bissau	\$2.16	1,832,201	3,867,320	\$30,536,677	210,000	\$145.41
Malaysia	\$2.34	4,181,896	8,049,216	\$69,698,271	565,000	\$123.36
Sierra Leone	\$2.60	1,716,291	9,765,507	\$28,604,843	100,000	\$286.05
Madagascar	\$2.73	1,539,227	11,304,734	\$25,653,783	300,000	\$85.51
Tanzania	\$3.35	755,870	12,060,604	\$12,597,840	125,000	\$100.78
Myanmar	\$3.78	1,790,324	13,850,928	\$29,838,734	507,000	\$58.85
Indonesia	\$4.04	30,679,644	44,530,572	\$511,327,397	2,900,000	\$176.32
India	\$4.10	1,133,760	45,664,332	\$18,896,005	448,000	\$42.18
Pakistan	\$4.46	2,026,638	47,690,970	\$33,777,304	157,000	\$215.14
Mexico	\$4.74	8,137,233	55,828,204	\$135,620,556	820,000	\$165.39
Gabon	\$4.90	1,698,338	57,526,542	\$28,305,641	150,000	\$188.70
Nicaragua	\$5.13	681,651	58,208,193	\$11,360,853	65,000	\$174.78
Vietnam	\$5.32	2,564,008	60,772,201	\$42,733,462	157,000	\$272.19
Ecuador	\$6.53	684,104	61,456,305	\$11,401,728	150,500	\$75.76
Thailand	\$6.53	603,800	62,060,105	\$10,063,336	240,000	\$41.93
Papua New Guinea	\$6.58	4,570,866	66,630,971	\$76,181,108	380,000	\$200.48
Venezuela	\$6.83	1,124,822	67,755,793	\$18,747,035	223,500	\$83.88
Philippines	\$6.90	1,762,242	69,518,035	\$29,370,699	240,000	\$122.38
Brazil	\$6.98	872,828	70,390,863	\$14,547,128	1,000,000	\$14.55
Honduras	\$7.83	1,631,183	72,022,046	\$27,186,382	67,200	\$404.56
Panama	\$7.95	1,056,887	73,078,933	\$17,614,785	170,000	\$103.62
United States	\$8.34	1,953,947	75,032,880	\$32,565,786	195,000	\$167.00
Colombia	\$11.31	2,261,764	77,294,644	\$37,696,062	350,000	\$107.70



Financing Blue Carbon



CLIMATE
ACTION
RESERVE

UN-REDD
PROGRAMME

VCS | VERIFIED
CARBON
STANDARD



