Opportunities and Challenges for Community-Based Seagrass Conservation

August 2020



Association for Coastal Ecosystem Services Edinburgh Napier UNIVERSITY



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Inside Images

A school of damselfish dominating seagrasses. © Photo by Dimitris Poursanidis

Scuba divers enjoying a sea turtle on a healthy seagrass meadow. © Photo by Ewout Knoester

A degraded seagrass meadow due to predation by sea urchins. © Photo by Ewout Knoester

Abandoned fishing gear entangled on a seagrass patch. © Photo by Dimitris Poursanidis

Boat anchor lodged into a seagrass bed. © Photo by Dimitris Poursanidis

Exposed rhizomes and matte of Posidonia meadows. © Photo by Dimitris Poursanidis

A school of cow bream (Salema porgy) swimming on a seagrass bed. © Photo by Dimitris Poursanidis

Illustration of the processes of carbon sequestration and storage in a seagrass meadow. © Illustration by Dr Amrit Dencer-Brown

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Glossary of terms

Additionality	The concept that a project taking place is in addition to the baseline – i.e. what would have taken place in the absence of the intervention. In the context of carbon-based PES, ensuring additionality means that there are net CO_2 emissions reductions
Allochthonous carbon	Carbon that has entered a location from other source(s) (e.g. organic carbon transported via rivers into coastal habitats) and stored in the soil.
Autochthonous carbon	Carbon that was produced locally by the vegetation and stored in the soil.
Blue carbon	The organic carbon captured and stored by marine habitats, most notably in mangroves, saltmarsh and seagrass meadows.
Carbon credit	A unit available for purchase representing carbon sequestered
Carbon density	The amount of carbon per unit area for a given ecosystem
Carbon sequestration	A process by which carbon is removed from the atmosphere and stored (naturally or artificially) over an indefinite period of time
Carbon sink	A natural reservoir which stores carbon-containing organic compounds accumulated over an indefinite period of time
Carbon standard	A set of specifications required for certification under a particular certifying body for a project to trade carbon offsets
Community-based ecosystem management	A bottom-up approach to ecosystem management that involves local stakeholders in planning, development, research and ongoing management
Ecosystem services	The benefits that humans gain from ecosystems and the natural environment
Leakage	The displacement of carbon emissions outside the boundaries of a project, that resulted from intervention(s) associated with the project, resulting in no net avoidance of emissions
Nature-based solutions	Actions that sustainably manage, protect and/or restore ecosystems in ways that address socio-environmental challenges and deliver societal, biodiversity and/or climate benefits
Nursery habitat	A habitat that contributes disproportionately to the number, growth and/or survival of juvenile forms of marine species
Payments for ecosystem services	Payments made to land managers to enhance or facilitate ecosystem service delivery, conditional on delivery of services
Remineralisation	The breakdown of organic matter into its constituent inorganic forms
Seagrass	Rooted, flowering plants (angiosperms) which grow in coastal (intertidal and subtidal) habitats. These belong to four families (Posidoniaceae, Zosteraceae, Hydrocharitaceae and Cymodoceae) in the order Alismatales.

List of abbreviations

С	Carbon
BAP	Biodiversity Action Plan
CaCO3	Calcium carbonate
CBM	Community-based management
CO2	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
EU	European Union
ha	Hectare
km²	Square kilometres
LMIC	Low and Medium Income Country
LMMA	Locally Managed Marine Areas
NDC	Nationally Determined Contributions
MLG	Multi-level governance
PES	Payments for ecosystem services
tC	Tonnes of carbon
tCO ₂ e	Tonnes of carbon dioxide equivalent
Tg	Teragram (equal to 1012 (one trillion) grams, or 109 (one billion) kilograms)
UK	United Kingdom

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Payments for Ecosystem Services (PES)-based community seagrass conservation: Strengths, Weaknesses, Opportunities and Threats

STRENGTHS	WEAKNESSES
Existing stocks of carbon buried beneath seagrass meadows are large, with a global average of ~140 tonnes C ha- ¹ (similar to soil carbon in some terrestrial forests); globally, seagrass buries 48-112 Tg (million	 The carbon stock in seagrass meadows is generally lower than in mangroves and some terrestrial forests The monitoring of seagrass carbon stocks
tonnes) C yr-1	is expensive and requires scientific and technical expertise and equipment
Seagrass delivers numerous and diverse ecosystem services to coastal communities including coastal protection, habitat for fish and opportunities for tourism	Significant scientific uncertainties remain over the source of carbon stored in, and fate of seagrass carbon exported from, seagrass meadows
 Globally, community-based conservation is increasingly favoured by national policies 	
OPPORTUNITIES	THREATS
Community-based seagrass conservation presents an opportunity for fishing communities to manage the natural resource upon which they rely, taking ownership of natural resource management	The political environment for PES (in particular carbon sequestration) is susceptible to change as national and international policies and agreements evolve
The carbon sequestration potential of seagrass meadows means that their inclusion in NDCs would help nations to meet their commitments under the Paris Agreement	The carbon market, highly dependent on both the political environment and public opinion, is vulnerable to fluctuation, putting PES-funded projects at risk of declining financial income

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