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IMPLEMENTATION COMPLETION AND RESULTS REPORT

TF015409

ON A

GRANT

IN THE AMOUNT OF SDR 3.25 MILLION

(US$ 4.5 MILLION EQUIVALENT)

TO THE

UNIVERSITY OF QUEENLAND

FOR THE

CAPTURING CORAL REEF AND RELATED ECOSYSTEM SERVICES (CCRES)

June 19, 2019

Environment & Natural Resources Global Practice

East Asia And Pacific Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective {Jun 02, 2019})

Currency Unit	=	SDR
SDR 0.72	=	US$1
US$1.38	=	SDR 1

FISCAL YEAR
July 1 - June 30

Regional Vice President:	Victoria Kwakwa
Country Director:	Mara Warwick
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ABBREVIATIONS AND ACRONYMS

ASEAN	Association of Southeast Asian Nations
AWGCME	ASEAN Working Group on Coastal and Marine Environment
BCR	Benefit-Cost Ratio
CCU	Country Coordinating Unit
CCRES	Capturing Coral Reef and Related Ecosystem Services
COREMAP-CTI	Coral Reef Rehabilitation and Management Project – Coral Triangle Initiative
CRTR	Coral Reef Targeted Research
DENR	Department of Environment and Natural Resources, Philippines
DINAS	Marine and Fisheries Agency, Selayar
EAP	East Asia and Pacific region
EbBD	Ecosystem-based Business Development
GEF	Global Environment Facility
ICR	Implementation Completion and Results report
ICRR	Implementation Completion and Results report Review (IEG)
IEG	Independent Evaluation Group
LIPI	Indonesian Institute of Marine Science
MPA	Marine Protected Area
MSP	Marine Spatial Planning
NGO	Non-Governmental Organization
NPV	Net Present Value
PCSD	Palawan Council for Sustainable Development, Philippines
PEA	Project Executing Agency
PDP	Philippines Development Plan
PEMSEA	Partnerships in Environmental Mgmt. for the Seas of East Asia
PRDP	Philippines Rural Development Project
PSU	Palawan State University, Philippines
RPJPN	National Long-Term Development Plan 2005-2025 (Indonesia)
SMARTSeas PH	Strengthening Marine Protected Areas to Conserve Marine Key Biodiversity Areas in the Philippines (GEF/UNDP project)
UPMSI	University of the Philippines Marine Science Institute
UQ	University of Queensland
WAVES	Wealth Accounting and Valuation of Ecosystem Services

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DATA SHEET

BASIC INFORMATION

Product Information

Project ID	Project Name
P123933	Capturing Coral Reef and Related Ecosystem Services (CCRES)
Country	**Financing Instrument**
Philippines	Investment Project Financing
Original EA Category	**Revised EA Category**
Partial Assessment (B)	

Organizations

Borrower	Implementing Agency
The University of Queensland	Research Partnership Office

Project Development Objective (PDO)

Original PDO

The Project Development Objective is to design and support the uptake of innovative models for valuing mangrove, seagrass and coralreef ecosystem services with the potential to enhance the sustainability of marine-based enterprise and marine spatial planning in select coastal communities in Indonesia and the Philippines.

FINANCING

	Original Amount (US$)	Revised Amount (US$)	Actual Disbursed (US$)
World Bank Financing			
TF-15409	4,500,000	4,500,000	4,500,000
Total	**4,500,000**	**4,500,000**	**4,500,000**
Non-World Bank Financing			
Borrower/Recipient	2,000,000	0	0
Total	**2,000,000**	**0**	**0**
Total Project Cost	**6,500,000**	**4,500,000**	**4,500,000**

KEY DATES

Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
30-Sep-2013	06-Nov-2013	03-Oct-2016	31-Dec-2018	31-Dec-2018

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Amount Disbursed (US$M)	Key Revisions

KEY RATINGS

Outcome	Bank Performance	M&E Quality
Moderately Satisfactory	Moderately Satisfactory	Substantial

RATINGS OF PROJECT PERFORMANCE IN ISRs

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US$M)
01	21-Jun-2014	Satisfactory	Satisfactory	.67
02	08-Feb-2015	Satisfactory	Satisfactory	.98
03	17-Aug-2015	Satisfactory	Satisfactory	1.61

04	02-Mar-2016	Satisfactory	Satisfactory	2.01
05	22-Apr-2017	Satisfactory	Satisfactory	3.08
06	19-Jun-2018	Satisfactory	Moderately Satisfactory	4.29
07	17-Dec-2018	Satisfactory	Moderately Satisfactory	4.29

SECTORS AND THEMES

Sectors

Major Sector/Sector	(%)
Agriculture, Fishing and Forestry	**100**
Agricultural Extension, Research, and Other Support Activities	47
Fisheries	9
Livestock	9
Other Agriculture, Fishing and Forestry	35

Themes

Major Theme/ Theme (Level 2)/ Theme (Level 3)	(%)
Environment and Natural Resource Management	**100**
Environmental Health and Pollution Management	51
Air quality management	17
Water Pollution	17
Soil Pollution	17
Renewable Natural Resources Asset Management	49
Biodiversity	49

ADM STAFF

Role	At Approval	At ICR
Vice President:	Axel van Trotsenburg	Victoria Kwakwa
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I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

A. CONTEXT AT APPRAISAL

Context

1. The East Asia and Pacific region (EAP) supports tremendous marine biodiversity: the world's marine biodiversity epicenter lies within the Coral Triangle where coral reefs are among the world's most abundant and diverse. Southeast Asia contains 30% of the world's reefs (WRI, 2012), 33% of the world's mangrove resources, at least 20% of its sea grass meadows (Fortes, 2010), while its seas produce some 19 million metric tons of fish annually; representing approximately 25% of global marine fish production (Garces, 2008).

2. The region's coastal marine ecosystems, comprising mangroves, coral reefs and sea grass meadows deliver a broad variety of provisioning, regulating and cultural ecosystem services (MEA, 2005). Healthy coral reefs and mangroves form the first line of defense against storm surge and sea level rise for low lying islands and atolls. Beyond their role in absorbing storm surges, mangroves and seagrass meadows serve as global public goods, sequestering significant amounts of Carbon in living tissue and across an extensive underwater root system and organic soil matrix that may reach several meters in depth. Coastal ecosystems such as mangroves, tidal marshes and seagrass meadows are increasingly recognized for their role in mitigating climate change by sequestering and storing more Carbon per unit area than terrestrial forests (IUCN, 2019).

3. The biodiverse marine environment supports livelihoods and food security for large populations of the region's poor with a high dependency on coral reef fisheries. Populations in the Philippines and Indonesia, in particular, derive up to 70 percent of their animal protein intake from marine fisheries (ASEAN, 2002). More than 128 million people live on the coast with 30 km of a coral reef, which is more than every other coral reef region combined (WRI, 2012), and marine resources in the region serve as an economic base of fisheries, shipping, transport, and ecotourism industries (Francisco, 2016).

4. These activities, in turn, place enormous pressure on the natural resources base and its ability to provide sustained crucial ecosystem services. The degradation of marine habitats, especially coral reefs and mangroves, is adversely affecting fisheries and coastal livelihoods and increasing vulnerability to climate-related risks. Meanwhile, regional efforts to reverse this trend are falling short: coral reefs in this region are the most threatened in the world with nearly 95 percent of reefs under threat, and about 50 percent in the high or very high threat categories. The threat is particularly high in the Philippines and central Indonesia (WRI, 2012).

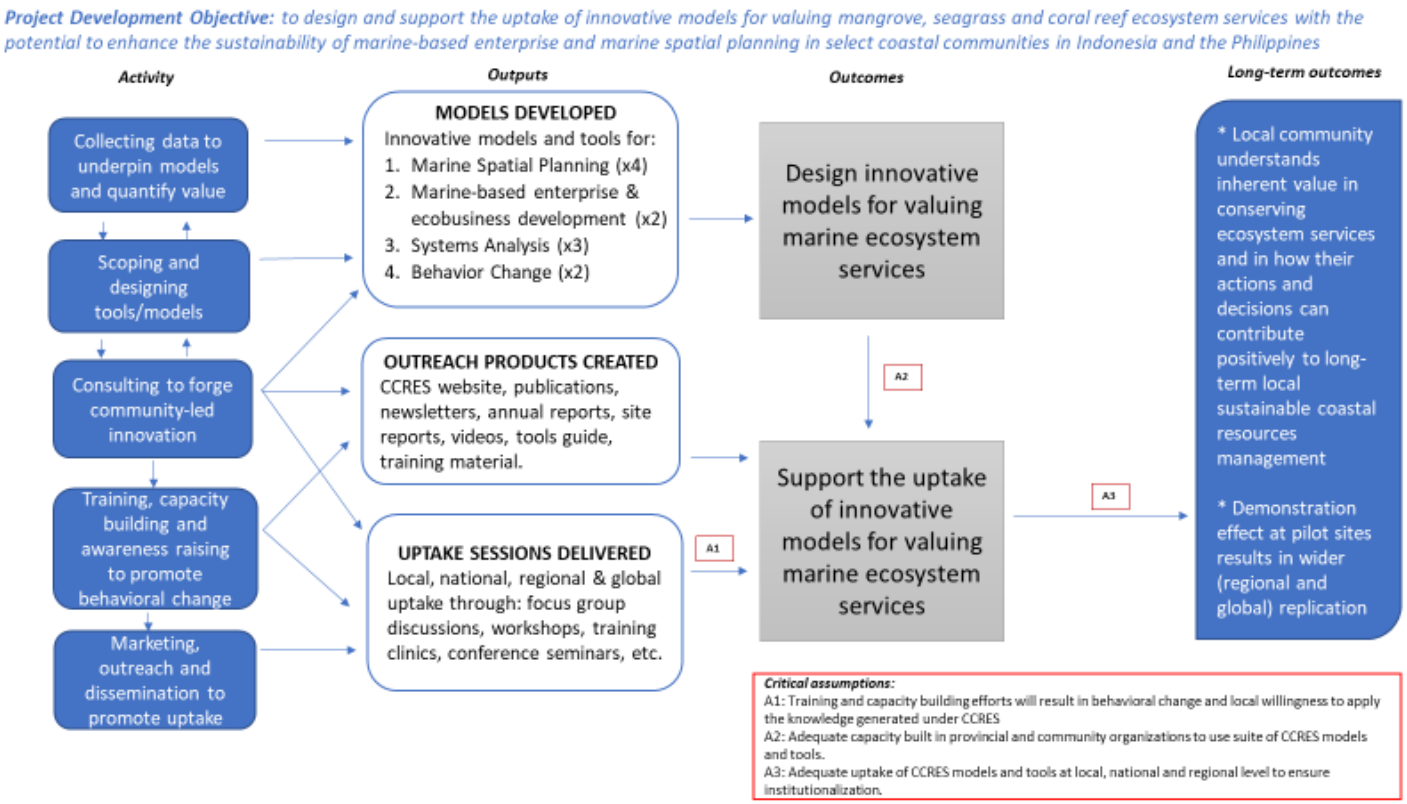
5. At the time of Project appraisal, governments, research institutions and development partners in the region were seeking to understand what options were at their disposal to reverse this trend. Much was known about the role of Marine Protected Areas (MPAs) to sustain and rebuild fisheries, but questions remained around what size and placement was optimal to ensure a balance between conservation and fisheries. Economic factors were known to be a significant driver of coastal degradation, but little work had been done to explore alternative livelihood scenarios for local communities. It was also understood that socio-cultural

factors also play an important role in perpetuating behaviors that result in local environmental degradation, although few approaches to systematically adjust these behaviors had been identified.

6. *The Capturing Coral Reef and Related Ecosystem Services Project* (CCRES) was designed with these open questions in mind, to bridge the "science-to-action" gap and achieve long-term conservation by raising awareness and building local community resource management skills to leverage local ecosystem services in a sustainable way to support livelihoods. To accomplish this, the Project aimed to develop and deliver innovative tools and models to support coastal planners and communities in decision-making around ecosystem services with an initial focus on coastal communities in Selayar (Indonesia) and in El Nido (the Philippines).

Theory of Change (Results Chain)

7. CCRES was designed to fill gaps that had been identified in the policy making and conservation action space, to design science-based models to help coastal planners understand how and where to focus conservation efforts and to support coastal communities in gaining a better understanding of their local environment, its ecosystem services, and their central role in ensuring long-term conservation outcomes.



Project Development Objectives (PDOs)

8. The PDO, as set out in the Grant Agreement dated November 6, 2013, is "*to design and support the uptake of innovative models for valuing mangrove, seagrass and coral reef ecosystem services with the potential to enhance the sustainability of marine-based enterprise and marine spatial planning in select coastal communities in Indonesia and the Philippines*". A detailed explanation of the functionality and applicability of the suite of tools and methodologies is presented in the *CCRES Tools & Training Guide* (See *https://ccres.net/resources/view/ccres-toolkit-guide* and Annex VI).

Key Expected Outcomes and Outcome Indicators

9. The PDO indicators established to track progress towards achieving the PDO were as follows:

(i) Innovative models developed at two or more sites by the project, demonstrating explicit links between ecosystem health, the value of ecosystem services, and their distribution among stakeholders;
(ii) Develop new or improve existing business models directly or indirectly linked to coastal marine zone ecosystem services in at least two sites; and,
(iii) Project developed models and knowledge products inform the design of regional and national projects, development plans or policies and community based coastal resources management plans.

10. In addition, the GEF IW indicator for (iv) "Plans/projects call for reducing stress to maintain value of ecosystem services" and World Bank core sector indicator for (v) "Direct project beneficiaries (number), of which female (percentage)" also tracked progress toward achievement of the Project's objectives.

Components

11. The Project was organized in four Components:

(i) **Quantifying the value and market potential of coral reef and mangrove ecosystem services** *(Estimated GEF US$1.6 M and University of Queensland (UQ) and co-financing US$.5M*; *Actual GEF US$1.4M and UQ US$0.5M).* Component 1 sought to demonstrate how ecosystem services can be accurately valued and systematically managed to deliver pro-poor, pro-environment outcomes and to help build the political rationale for change. It aimed to show this through innovative tools for marine reserve design and modeling flows of services, to be tailored to the specific needs of people and eco-businesses in tropical coastal areas. Tools to be developed and customized would allow stakeholders to visualize the production and flows of ecosystem services and therefore evaluate the consequences of different scenarios for development and management.

(ii) **Forging community-led innovation in capturing and sustaining benefits from marine ecosystem services and enhancing resilience in the face of climate change** *(Estimated GEF US $1.7 M and UQ co-financing US$0.4M; Actual US$1.3M and US$0.37M)*. The main objective behind Component 2 was to empower communities to move away from unsustainable coastal resource use practices through the development of sustainable alternative enterprises and new income-generating opportunities. It aimed to achieve this outcome by bringing 'whole of system' thinking to the way coastal communities develop businesses linked to ecosystem services to demonstrate how community-led innovation can generate sustainable alternative livelihoods options for poor fishing communities whose coral reef fisheries are

heavily overfished.

(iii) **Promoting behavioral change through outreach, decision support and regional learning from results in selected field sites** *(Estimated GEF US $0.8 M; UQ co-financing A$0.6 M; Actual US$0.76 and US$0.34M)*. Component 3's focus was to work with a key stakeholders on the ground to share the project products and findings and help channel these into appropriate policy and management outlets through a focus on the effective uptake of knowledge generated from Components 1 and 2. The Component also sought to develop communication tools to sensitize communities to sustainability issues, inform local government about tradeoffs involved in different decisions regarding the use of marine space and natural capital, and help communities visualize the future under different climate scenarios and management regimes in which ecosystems services are sustained or lost.

(iv) **Project coordination and management** *(Estimated GEF US $0.4 M and UQ $0.00; Actual US$0.6M and US$0.07M)*. The Component involved the overall coordination and management of Project implementation through a dedicated Project Executing Agency (PEA) at the University of Queensland to oversee project implementation, Monitoring and Evaluation (M&E), outreach and communication activities, and future planning, including development activities to identify future co-financing and new partnerships.

B. SIGNIFICANT CHANGES DURING IMPLEMENTATION (IF APPLICABLE)

Revised PDOs and Outcome Targets

N/A

Revised PDO Indicators

N/A

Revised Components

N/A

Other Changes

N/A

Rationale for Changes and Their Implication on the Original Theory of Change

N/A

I. OUTCOME

A. RELEVANCE OF PDOs

12. The Project is highly relevant in the national context of Indonesia and the Philippines as well as in regional and global contexts more broadly. CCRES objectives have been and remain closely aligned with the national development plans of Indonesia and the Philippines and with the World Bank Group's (WBG) country partnership frameworks for both countries throughout the duration of identification, preparation, implementation, and closure.

13. In the Indonesian context, CCRES objectives align squarely with the current WBG Country Partnership Framework (CPF) FY16-20 across two of its main engagement areas: (i) to ensure holistic natural resources management (engagement area 6); and (ii) expand the maritime economy (engagement area 3) to build sustainable livelihoods for Indonesia's poor. The current CPF builds on the predecessor Country Partnership Strategy (CPS) for FY13-15, elaborated contemporaneously to CCRES, in its "Pro-Green" engagement area that focused on sustainable development and disaster risk management through investments for the protection of coastal and marine natural resources. The WBG's focus, in turn, corresponds to Indonesia's national development priorities as outlined in the National Long Term Development Plan (RPJPN) 2005-2025. RPJPN's Pillar 6 promotes sustainable growth through the use of natural resources, preserving their functions for socio-economic activities and improving the management of natural resources and the environment to support quality of life.

14. Similarly, in the Philippine context, CCRES development objectives align strongly with the current CPF FY15-18 under engagement area 4, which focuses on increasing resilience and improving natural resource management and sustainable development. This engagement area builds on the Country Assistance Strategy (CAS) FY10-12 from the time of CCRES appraisal, whose strategic objective #4 sought to reduce vulnerabilities and support disaster risk management, especially through coastal zone management and coastal and marine ecosystem conservation interventions. The strategic objectives across CPF-periods corresponds to the national development agenda as presented in the Philippines Development Plan 2011-2016 (PDP). PDP outlined the national vision for conservation, protection and rehabilitation of the environment (Chapter 10), setting out actions to address threats to coastal resources, including initiatives related to MPA establishment, as well as actions to conserve biodiversity and enhance coastal and marine resources management.

15. At the regional level, the shared objective for sustainable natural resources management around the marine and coastal environment is captured by Indonesia and the Philippines through their joint engagement in the Philippines based Partnerships in Environmental Management for the Seas of East Asia (PEMSEA), which seeks integrated solutions for effective management of coastal and marine areas to have positive impact on communities through enhanced food security and livelihood opportunities, amongst other focal areas. The shared objective is further enshrined in Indonesia and the Philippines joint commitment to the "Blueprint for the ASEAN Socio-Cultural Community (ASCC Blueprint) 2025" that serves as the guiding mandate of ASEAN Working Group on Coastal and Marine Environment (AWGCME). AWGCME aims to ensure that (i) ASEANs coastal and marine environment are sustainably managed; (ii)

representative ecosystems, pristine areas, and species are protected; (iii) economic activities are sustainably managed; and (iv) public awareness of the coastal and marine environment instilled.

16. At the global level, CCRES aimed to influence national coastal development and marine conservation trajectories by communicating the Project's results and outputs to targeted stakeholders at the global level. In doing so, CCRES has the potential, for example, to contribute to the achievement of the Aichi target for conservation of biodiversity and ecosystem services "…through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes"[1]

Assessment of Relevance of PDOs and Rating

17. Given the above contribution to the national, regional and global development agenda, the clear alignment of CCRES's development objectives with the World Band Group country engagement strategies in Indonesia and the Philippines, and the explicit domestic development targets that Indonesia and the Philippines have set in their natural resource management agendas, CCRES objective is considered highly relevant.

18. Based on the factors outlined above, PDO relevance is rated **High**.

B. ACHIEVEMENT OF PDOs (EFFICACY)

19. During implementation, CCRES was effective in achieving its objectives as set out in the Grant Agreement and the Results Framework. At closure, CCRES had met or exceeded all PDO level results indicators and intermediate result indicators for each Component.

20. Objective 1: To design innovative models for valuing mangrove, seagrass and coral reef ecosystem services

CCRES developed a suite of tools (macro models[2]) that strengthen the ability of coastal and marine resources management planners to make improved evidence-based decisions on the relative importance of marine ecosystems (mangroves, seagrass and coral reefs) and of coastal biodiversity and ecosystem service functions for coastal protection, resilience, livelihoods, income generation, and food security.[3] These tools are innovative in a number of ways, but with specific regard to the valuation of mangrove, seagrass and coral reef ecosystem services marine planning tools, they have two principal innovations. Their primary innovation is that they enable a multidimensional assessment that captures the value of marine, coastal and fishery resources and allows for decision-making for marine conservation in a dynamic context based on that value (coastal erosion, local fishing levels, MPA sizing and location). A further innovation is that a subset

[1] Aichi Biodiversity Targets, Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity; available at https://www.cbd.int/sp/targets/

[2] A suite of fourteen models and tools that support (i) marine planning; (ii) systems analysis; (iii) eco-business development; or (iv) behavior change. For full list of models developed and a description of model functionality, see Annex VI.

[3] The four tools that focus specifically on the valuation of marine resources are: (i) Reef React, to predict alternate futures for coral under various human use and climate scenarios; (ii) FoodWeb, to show which reefs are best suited for conservation compared to reef fisheries; (iii) Coastal Protection, to assess what marine resources best protect coastal infrastructure, and how; and (iv) the MPA toolkit, to support decisions around MPA coverage in order to sustain and rebuild fisheries and to protect coastal biodiversity. For full descriptions, see Annex 6.

of the marine planning macro models allow for alternative scenarios to be assessed, providing a counterfactual from a 'no conservation' effort to what different levels of conservation effort would imply, for example in a given location or under certain conditions and weighing the benefits of conservation against the costs to local fishers to assess future sustainability.

21. As such, these tools provide decision-makers and coastal planners with valuable information as to the effectiveness of proposed conservation interventions and the potential tradeoffs among those interventions, to facilitate prioritization and decision-making. While subsets of planning tools existed previously, the multidimensional nature of the CCRES models brought a level of innovation and sophistication to the science-based conservation action space that can enable more robust and holistic conservation decision-making going forward at various levels.

22. The PDO level results indicators most closely linked to this objective were: (i) *Innovative models developed at two or more sites by the project, demonstrating explicit links between ecosystem health, the value of ecosystem services, and their distribution among stakeholders*; and, (ii) *Develop new or improve existing business models directly or indirectly linked to coastal marine zone ecosystem services in at least two sites*.

23. With regard to *(i) Innovative models developed at two or more sites by the project, demonstrating explicit links between ecosystem health, the value of ecosystem services, and their distribution among stakeholders*: CCRES developed the four innovative tools for marine planning (Reef React, FoodWeb, Coastal Protection, and MPA toolkit, described above) which link ecosystem health to local value and can be used independently or together as a toolbox to provide coastal planners with detailed information on optimal marine ecosystem protection. These models were developed through a rigorous data collection - collecting site-specific geo-spatial and bio-physical data to underpin tool design and functionality – at pilot sites in Selayar (Indonesia) and (El Nido) the Philippines.

24. As data collection activities took place, tool design began, based on extensive consultation with key stakeholders starting at field sites in 2013.Stakeholder feedback was used to make tools more user-friendly and better tailored to local conditions. These tools make explicit links between ecosystem service protection and long-term conservation benefit. Understanding these links enable coastal planners and policymakers to make more evidence-based decisions on the design marine plans that consider the area to be set aside for reserves, their size, and optimal design in order to sustain and rebuild fisheries and to protect coastal biodiversity. Achievement of this outcome was furthermore measured through the first and second intermediate results indicators established under Component 1 (Indicator 1: At least three models of ecosystem function and services developed (Target: 3; Actual at Completion: 4] and Innovative, comprehensive decision support systems for marine reserve design which help optimize management objectives developed [Target 2; Actual achieved at Completion: 5]).

25. With regard to *(ii) Develop new or improve existing business models directly or indirectly linked to coastal marine zone ecosystem services in at least two sites*: CCRES designed two business models under Component 2 to support eco-entrepreneurship. The Ecosystem-based Business Development (EbBD) tool, developed at Selayar, uses ecosystem services and biodiversity as part of an overall sustainable development strategy to help support sustainable livelihoods and local economic development in low

resource coastal communities. It uses coaching clinic and stakeholder workshops to forge community innovation as it steps participants through a thinking process designed to help identify enterprise-led solutions that share value along the supply chain and do not cause damage to the environment. In terms of uptake, the Selayar community helped forge businesses directly as a result of EbBD engagement at the site: one such business is a collaboration between three Selayar villages in Selayar — Patikarya,Barat Lembongan, Gusung Barat and Bahuluang — who are implementing community-based tourism through homestays; a second new business forged from EbBD activities is the Waste2Enterprise (W2E) initiative that empowers villagers to use business solutions and community-based management to address the critical issue of ocean plastics.

26. The second business model, Eco-Biz Challenge, was developed and deployed at both Selayar and El Nido, sought to identify local entrepreneurs and assist them in forging or expanding businesses that support the local economy in a way that is compatible with the local ecosystem or leverages local ecosystem services in a sustainable way. The process used a competitive approach towards ecosystem-based entrepreneurship by expanding the pool of local talent and incubating eco-friendly business ideas. In terms of interest and uptake in El Nido, the Eco-Biz Challenge elicited responses from 56 applicants, 28 of whom were selected for seed funding and hands-on business skills training in basic planning, accounting, and marketing skills for entrepreneurship. The competition catalyzed entrepreneurship and helped forge community-led innovation initiatives in (i) using coconut as an alternative to mangrove wood; (ii) eco-tourism in the mangroves; (iii) cultivating giant bamboo to reduce logging in native forests; and (iv) supplying ornamental native flowers to the tourism industry. In Selayar, the competition attracted 143 applications, with 53 semi-finalists undertaking the business skills training, and resulting in 3 start-up ideas attaching CCRES seed financing for business development: (i) an aquaculture project focusing on floating grouper and lobster grow-out cages; (ii) 'One Mangrove One Student', an educational tourism approach focused on mangrove conservation; and (iii) a handicrafts shop with products made from recycled waste.

27. The achievement of the intermediate results indicators under Component 2 were also critical for the full achievement of this Objective. Component 2 aimed to forge community-led innovation in capturing and sustaining ecosystem services and enhancing resilience – in empowering communities to move away from unsustainable coastal resource use practices through the development of sustainable alternative enterprises and new income-generating opportunities. In addition to the eco-business development tools under Component 2, CCRES *develop[ed] and analyze[d] system maps for each site detailing interaction between specific ecosystem services and social economic sectors* (Original target:4; Achieved at Completion: 5). Maps were elaborated through focus group discussions (FGDs) with local communities in both pilot sites to help local stakeholders visualize the systemic connections between economic or socio-economic activities and ecosystem degradation. The maps cover (i) food security (elaborated through 36 FGDs), (ii) water pollution (15 FDDs), (iii) fish catch decline (16 FGDs), (iv) mangrove loss (19 FGDs and (v) reef fisheries decline (17 FGDs) – priority areas highlighted by local communities – to understand the impact of human activities on the local environment and visualize alternative scenarios for system trajectories over time.

28. In the same vein, the systems-based maps provide […] *affordable decision toolkit for use by stakeholders [that is] applicable across all sites* (original target: 1; actual achieved at Completion: 2) to showcase the cumulative impact of community behavior and depict clearly what an end scenario would look

like should communities follow along the path of unsustainable resource use. From one FGD with the Ministry of Marine and Fisheries (MMAF), Indonesia, 91% of planners said they would recommend or highly recommend using the decision tools for coastal management.

29. *Objective 2: To support the uptake of innovative models for valuing mangrove, seagrass and coral reef ecosystem services*

The Results Indicators established to track progress towards achievement of this objective were for "*Project developed models and knowledge products inform the design of regional and national projects, development plans or policies and community-based coastal resources management plans*" and "*Plans/projects call for reducing stress to maintain value of ecosystem services*" GEF International Waters (IW) Indicator). Achievement of this outcome was furthermore measured through the third intermediate results indicator established under Component 1 (Planning frameworks that incorporate models of ecosystem functions and services, including coastal defense, and decision support systems developed in response to stakeholder demand (e.g. local government), [Original target: 2; actual achieved at Completion: 3].

30. During implementation, CCRES supported significant uptake surpassing its end target by demonstrating at least 19 instances of uptake versus the original end-of-project target of 5. CCRES-supported uptake activities took place throughout Project implementation, culminating in a total of 50 uptake promotion events across the life of the Project (which ensured the achievement of Intermediate Results Indicator 1 under Component 3 (*Information and knowledge products shared with the Strategic Partnership for East Asian Seas (PEMSEA), governments, technical networks and existing projects;* Target 40; Actual at Completion: 50). For example, in 2018 alone, these events ranged from local to international, including events like the third Targeted Regional Workshop for Global Environment Facility International Waters Projects (April); The Asia-Pacific Coral Reef Symposium, Cebu (June); Our Ocean Conference 2018, Bali, (October); Global Environment Facility International Waters Conference, Marrakesh (November); PEMSEA East Asian Seas (EAS) Congress 2018, Iloilo City (November).

31. During the initial stages, uptake activities mainly included marketing and outreach events, raising awareness among relevant pre-identified key stakeholders about the tools and models under development. As CCRES-financed tools became finalized and ready for targeted application, uptake activities focused increasingly on applying tools in local, national or regional projects to influence plans to reduce ecosystem stress by showing the value in conservation action. Venues for uptake included CCRES Stakeholder Forums, gathering policy-makers, planners, and representative local government representatives; CCRES workshops, to give hands-on training and build capacity on how and when CCRES models could be applied, and focus group discussions, to get stakeholder feedback to help further refine model functionality and application. There are numerous examples of the use and application of innovative tools, products and methodologies developed by CCRES that illustrate the value of marine ecosystems. Select examples are noted below and the full list of uptake instances captured through Project closure are listed in Annex 1.

32. Some notable examples of uptake activities in Indonesia include: the marine planning tools and MPA Toolkit being applied by local government to plan MPAs in 3 sites Seram, Sulawesi Tenggara and Simeulue, Aceh; the MPA Toolkit being institutionalized by WWF Indonesia and being rolled out across 34 provinces;

the FishCollab tool being used by local villages across Selayar to prepare community-designed MPAs and management plans. In addition, a World Bank project under implementation through GEF funding, COREMAP-CTI, is applying Reef React as an input in developing a Coral Reef Health Index.

33. In the Philippines, uptake activities for CCRES-developed models, tools and knowledge products with local planners has resulted in: the Palawan Council for Sustainable Development and WWF Palawan using the MPA Toolkit to support MPA design in Cluster 5 municipalities in north-eastern Palawan (Linapacan, Taytay, Dumaran, Roxas and Araceli); the suite of marine planning tools being used to plan an MPA in the Tanon Strait Protected Seascape; Fish SPACE and the MPA Size and Placement Optimization tools being used in Oriental Mindoro, Lanuza Bay, Palawan and Batangas; and local partnership with the Haribon Foundation through partnership with the Department of Environment and Natural Resources (DENR/UNDP Smart Seas PH Project), who have used Fish SPACE to evaluate marine reserve design and fisheries management initiatives in Surigao del Sur, Philippines.

34. In terms of regional and global uptake, the Government of Palau is applying the MPA Toolkit and CCRES models are also being applied by RARE, a CCRES NGO partner, it its work in Central America and the Caribbean. In the wake of Project closure there are a number of initiatives under advanced planning that aim to apply CCRES tools at global or regional scale, including proposals with the UN Food and Agriculture Organization (FAO) and the Global Environment Facility (GEF).

35. Additional evidence regarding uptake and the contribution of CCRES tools towards the valuation of marine resources comes from the perception-based indicator under Component 3 - *Stakeholders perceive benefits in incorporating information on ecosystem services into decision-making (% of target end users who have used one or more CCRES tools to inform decision-making; Target: 15%; Actual achieved at Completion: 59 %).* Though inherently challenging to measure, perception analyses were carried out through values and attitudinal surveys at Project closure. Based on respondent feedback following two workshops (one in each pilot location) in 2018, over 97 percent of participants agreed or strongly agreed that following their involvement with the CCRES project, they saw benefits in using information on ecosystem services to support decision-making around marine resource management.

Justification of Overall Efficacy Rating

36. Overall efficacy is rated as **Substantial**. This assessment is based on the factors listed above showcasing (i) the design and (ii) the uptake of innovative models, both of which achieved or surpassed end-targets set out.

C. EFFICIENCY

37. In assessing how efficiently resources and inputs were converted into results, both an economic analysis and an implementation efficiency analysis were carried out.

38. Economic Analysis: This quantitative analysis has important caveats. First, no appraisal stage economic assessment was undertaken, so baseline or comparative outcomes are not available. Second, there are inherent challenges in undertaking economic analyses related to the nature of provisioning,

regulating or cultural services provided by dynamic ecosystems whereby measures such as market values used to estimate natural capital stock and ecosystem service flow do not fully reflect all ecosystem services and their value is not explicit (World Bank, 2018).

39. While economists have developed methods for estimating the value of ecosystem services, valuations in terms of the welfare they generate are either imperfect reflections of that value or non-existent (Bateman, 2011). Restrictive assumptions are required, which result in a broad estimate of potential value. Third, the assessment of natural capital stocks and ecosystem flows in monetary terms implies that a non-natural substitute may be available to compensate for losses. It is generally agreed, however, that substitutability has its limits (TEEB, 2010) and that a critical amount of natural capital and ecosystem services needs to be conserved because of the complex interrelations between the individual services ecosystems provide locally, regionally and globally.

40. Nonetheless, subject to the above caveats, quantitative analysis shows that potential benefits from project implementation are plausible and were estimated based on a literature review (see Annex IV) that reflects the positive impact attributed to sustainable use of marine resources, principally coral reefs in the Coral Triangle. The analysis shows that CCRES could potentially generate substantial economic returns in the locality of the Indonesia pilot site under conservative assumptions and for different scenarios (see Table 1 and Annex IV). Potential benefits for the site in the Philippines are estimated significantly lower. A benefit-cost analysis was carried out using project financing costs (GEF financing plus University of Queensland co-financing) and compared with their estimated economic benefits for the first 20 years, both discounted to 2013 (the baseline year) with a mid-range 6% discount rate. The robustness of these results is verified by sensitivity analysis. Different discount rates (3, 6, and 10 percent) are applied.

Table 1. Results of Cost-Benefit Analysis for all Direct Project Costs between 2013 and 2033 (US$ Million)

	Optimistic incremental scenario		Pessimistic incremental scenario	
	NPV	BCR	NPV	BCR
Discount Rate 3%	31.8	6.5	8.8	2.5
Discount Rate 6%	20.8	4.8	4.7	1.9
Discount Rate 10%	11.9	3.4	1.5	1.3
IRR	28%		13%	

Note: NPV = Net Present Value; IRR = Internal Rate of Return; BCR= Benefit-Cost Ratio.

41. The potential benefits originate from the increased provisioning value of coral reefs in the pilot areas, allowing for improvements of decision-making processes at the level of both regulators and local communities accruing from Project capacity-building activities and behavior-change interventions. The economic benefits are based on the incremental benefits to the communities from fishing after application of new tools, information, etc. to prevent degradation of coastal ecosystems and to improve efficiency of local businesses that operate in a more sustainable manner. A critical assumption in this regard is the willingness of local communities to be influenced by and apply the new tools developed under the CCRES (the assumption is that training and capacity building efforts will result in behavioral change and local willingness to apply the knowledge generated under CCRES).

42. Under the optimistic scenario of CCRES-developed tool utilization, the Net Present Value (NPV) for the entire project is estimated to be US$20.8 million (at a discount rate of 6 percent), and the Internal Rate of Return is 28 percent. The potential cost of avoided coral reef reduction in Indonesia is dominant in the overall contribution to project benefits. It should be noted in terms of the quantitative analysis that not all benefits can be quantified with any degree of certainty. This includes those potential benefits from the tools being applied at the regional level or at national level in other countries, as well as those potential benefits accruing to local communities from capacity-building that took place during project implementation.

43. Implementation Efficiency Analysis: Overall, in terms of most measures of implementation efficiency, the project performed well. CCRES met or exceeded all its objectives as set out in the PDO, and achieved them cost-efficiently, either at or below all estimated Component costs except for Project Management (see Project Financing, Annex III). With regard to procurement or other activities that can sometimes contribute to inefficiencies in implementation, there were no delays or other issues of note to negatively impact implementation efficiency. All the activities were completed before the closing date and within the overall budget.

44. At the same time there were factors throughout implementation that raised transaction costs resulting in some inefficiencies during certain periods of implementation. There are two interlinked factors in this regard. One factor was staff turnover in the World Bank and in the PEA and a separate but related factor was the delay in accelerating uptake activities. Both of these factors negatively impacted implementation efficiency to varying degrees, though it is important to bear in mind that they did not negatively impact the overall Project outcome in terms of the PDO and indicators set out to measure it.

45. Staff turnover may have negatively impacted CCRES implementation efficiency (see Key Factors During Implementation, below). Task leader turnover at the World Bank (one TTL during preparation, a second during early implementation, and a third for the final three years of implementation) resulted in fragmented implementation support. Coordinator turnover at the PEA in 2017 resulted in the loss of institutional knowledge and required additional effort and time to invest in relationship building with Project partners and stakeholders. Turnover in task teams at the Project component level, in particular for the business development activities, resulted in trajectory shifts and additional time and resources were necessary to adapt strategy and further extend scoping and design activities. The combination of all of this turnover, while understandable during a five-year operation, increased transaction costs and may have been a limiting factor for higher implementation efficiency.

46. Several factors contributed to delays in uptake activities. Data collection and model scoping and development began at project effectiveness (September 2013) and continued for about three and half years during the five-year project lifespan. While there were instances of uptake by early 2016 (e.g. MSP in Indonesia), for the most part, models and tools were still under design through 2017. Delayed tool finalization resulted in some missed opportunities for CCRES to have early points of entry in programs with that could have leveraged and applied the tools for impact at a broader (regional and global) scale.

Assessment of Efficiency and Rating

47. CCRES efficiency is rated **Modest**. The Economic Analysis indicates that the Project may generate substantial returns in the long-run, assuming that there is sufficient long-term uptake and application of the tools designed and deployed under CCRES. Moreover, the Project overall was efficient in terms of cost-effectiveness and other measures of Implementation Efficiency. Nonetheless, there are some factors that induced inefficiencies in implementation, and while these did not negatively impact the overall outcome of CCRES as measured by its PDO, they may have resulted in some missed opportunities for CCRES tools and models to be applied in contexts that would have a demonstration effect in terms of replicability and scalability.

D. JUSTIFICATION OF OVERALL OUTCOME RATING

48. Based on the above factors of high relevance, substantial efficacy and modest efficiency, the overall project outcome rating is assessed as **Moderately Satisfactory**.

E. OTHER OUTCOMES AND IMPACTS (IF ANY)

Gender

49. At the macro level, CCRES tracked the Core Indicator "Direct project beneficiaries (number), of which female (percentage)". This was quantified as 3,001 beneficiaries, of which 47% were female. At a more micro level, gender-related outcomes varied by Component. During focus discussion groups, community meetings, and other capacity building interventions, female participation ranged from 100 percent of 96 participants (My Future, My Oceans rollout at El Nido with Ten Knots Corporation) to 0 percent of 8 participants (MPA workshop in Aceh).

50. The body of anecdotal evidence points to CCRES role in enhancing women's voice and agency in day-to-day decisions around how communities interact with and leverage local ecosystem services. One female workshop survey respondent noted that, for women in rural coastal locations, the hands-on capacity building provided during model uptake was the first time they had experienced such training and that for many, it was their first interaction with any formal education or training effort. This is particularly true of the behavioral change workshops and the systems-based thinking models (Systory and SESAMME). The latter were developed and refined in the field and piloted through a rigorous consultative approach in focus group discussions across project sites.

51. Understanding system-based approaches allowed participants to conceptualize how their actions have reactions and repercussions for their local environment and ecosystem, something that had not been apparent to them before exposure to CCRES-developed training. Similarly, there is anecdotal evidence of the behavior change workshops promoting female empowerment based on new-found awareness of environmental degradation – including some women requisitioning their fishermen husbands to collect marine debris and plastic when they are out fishing, a behavior that is not the norm in the pilot sites. In terms of observable impact, feedback from MyFuture, MyOceans behavior change workshop which included 96 women from two villages — Parak (intervention) and Padang (control). Participants were recruited for a four-day program that included facilitator training and workshops. Eleven psychometric indicators for women in both villages were measured before and after the trial, with findings consistent with those of previous similar trials: women felt empowered, and researchers witnessed demonstrable changes in behavior. Improvements were observed, for example, on six core psychological competencies and behaviors targeted by the pilot program (perceived plastic collection; problem solving skills; checking whether the fish participants consumed were caught safely or by destructive methods; perceived responsibility for the state of the environment; life satisfaction; and perceived impact of actions on the environment).

52. No unintended negative gender-related impacts were recorded (either during CCRES survey activities, during ICR interview feedback, or through the CCRES Grievance Redress Mechanism (GRM)).

Institutional Strengthening

53. Technical assistance provided by the CCRES team has helped to advance coastal resource management at the national and local level. Government institutions and NGOs at both project sites welcomed CCRES's interventions to enhance the knowledge and capacity of staff to better enable them to undertake marine special planning activities and to use results from models as the basis for enacting local legislation around land- and marine- based activities. . Particularly at the district government-level and community-level — although this was also alluded to by national-level organizations — the capacity building, awareness-raising and technical assistance provided by the CCRES project has had a tangible impact on coastal resource management at the community- level. In Indonesia, this impact is embodied by the finalization or revision of village-level regulations (PERDES) on coastal resource utilization and management, including finalization of a PERDES for Bungaiya village that had been stalled since 2009. Improved local knowledge about coastal resource management, and a paradigm shift from MPAs as "conservation fortresses" to MPAs as the foundation of sustainable enterprises were also highlighted.

54. In the Philippines, participants noted that training provided by the CCRES team, the Country Coordination Unit (CCU), and local partners had built capacity in local and national programs, although some tools would require specific expertise (e.g. GIS) to apply going forward. For example, rollout activities of the MPA Toolkit built capacity in the PCSD, SMARTSeas PH (United Nations Development Programme and the DENR) and partner organizations such as Haribon Foundation, Conservation International Philippines, and WWF. Technical staff from these institutions received a series of training sessions in 2017 and 2018 focusing on critical sites in the Philippines including Lanuza Bay (Surigao del Sur), Palawan (Cluster 5) and Batangas, where they have ongoing work programs. 'Cliniquing' workshops and direct technical support were provided to Batangas and Palawan, while a mentoring approach was used for Lanuza Bay. These engagements focused on embedding capacity in participating organizations so that staff will be able to independently replicate tools use in their other sites.

55. More generally, even though stakeholders benefited from targeted training and workshops that contributed to institutional strengthening, there is always a question of 'how much is enough?'. Interview feedback, particularly from Indonesia, was that while CCRES interventions did build capacity, the training on tools was based on beta versions, with no official launch of or training on finalized tools, and that this would contribute to limited institutionalization. Meanwhile issues of incentivization also arose with some respondents lamenting that training sessions did not result in qualifications or certifications appropriate for civil servant career progression. At the community-level in Selayar, it was recognized that the project had resulted in increased knowledge and awareness, but that more training and technical assistance was needed to identify and develop local sustainable enterprise opportunities. Additional feedback from the Philippines was that more targeted outreach and tailored focus to specific agencies and audiences would have been beneficial and could have been combined with an educational component to enhance basic skills around environmental governance and then also enhance capacity through leveraging CCRES models.

56. Lastly, with reference to language issues, some respondents noted that while some models and tools (the business development tools under Component 2 and the behavior change tools under Component 3) are available in Bahasa for Indonesia, the remainder of Component 1 and 2 models are not. Language issues were also cited as a constraint in the Philippines, where English proficiency among local coastal communities is limited.

Mobilizing Private Sector Financing

57. The Project did not formally mobilize private sector financing as it was not part of Project design. However, there are notable examples of leveraging local private sector actors' resources and engagement to contribute to positive outcomes. In El Nido, the Ten Knots Development Corporation, an influential eco-tourism company, was a strong CCRES advocate and actively supported rollout and uptake activities and driving home the message to local planners that science-driven land- and marine- planning is critical for conservation efforts, on which their business model relies. In Selayar, Bali Seafood International, a leading international supplier of sustainably sourced seafood, was engaged throughout CCRES rollout and at the time of project closure was assessing establishing a fisheries management center in the area following engagement in the uptake activities around sustainable marine-based enterprises.

Poverty Reduction and Shared Prosperity

58. While data over the timeline of project implementation is inconclusive, it is likely that CCRES will contribute to poverty reduction in the project areas. CCRES promoted community-led innovation in capturing and sustaining benefits from marine ecosystem services. The Project reached rural communities with high incidence of poverty in large numbers (3,000 in total), providing training on the sustainable use of coral reefs, business development and promoting behavioral change. Based on available data, perception surveys, and anecdotal evidence, these activities empowered beneficiaries and created the potential for improved economic opportunities. Assuming that poorer members of the coastal communities who gained exposure to CCRES have the ability to capture income gains from sustainable marine-based enterprises, either through eco-entrepreneurship of their own or direct or indirect employment from new businesses established, CCRES would also have positive impacts in terms of inclusive growth and enhanced shared prosperity.

Other Unintended Outcomes and Impacts

59. In term of institutionalization, the various models developed under the project are being leveraged as didactic tools in the university curriculum at Palawan State University (PSU). There are also concrete plans in coordination with the PSU College of Education to apply the tools in elementary and high schools to help raise awareness among local communities about how their actions and interactions can impact the local environment, both positively and negatively. Project design did not intend to develop models for application in provincial education institutions, but this unexpected outcome and model institutionalization is likely to have positive impact.

II. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. KEY FACTORS DURING PREPARATION

60. Soundness of background analysis: CCRES was born from the lessons generated in an earlier GEF-financed project, the CRTR (US$11 million), which closed in 2011. CRTR sought to align, for the first time, the expertise and resources of the global coral reef community around key research questions related to the resilience and vulnerability of coral reef ecosystems. It also sought to build capacity for science-based management of coral reefs in developing countries.

61. CRTR's efforts – to use best-available scientific knowledge to deliver effective conservation – resulted in the identification of key knowledge gaps for policy-makers, coastal planners, and conservation organizations. In response, CCRES was developed to help fill these gaps and provide effective tools for science-based marine management ("science-to-action") through processes that empower coastal communities to grow incomes by leveraging and protecting local marine ecosystem services. CCRES design envisaged that tools and models developed to fill these gaps would be promoted partly under CCRES uptake activities, but that their main contribution would be achieved by being leveraged at scale by separate investment projects or programs focused on marine resources management and livelihood alternatives for coastal communities. The principal leverage opportunities identified during project preparation to show impact at scale were COREMAP-CTI, PRDP, and PEMSEA at the regional level and WAVES and GEF International Waters Focal Area, IW: Learn at the global level.

62. Integrating lessons learned: Preparation for CCRES advanced taking into account the key lessons from CRTR (as presented in its ICR). A core part of CCRES design was to understand the incentives that lead people to exploit this resource unsustainably and to provide alternative sources of income in the short-term that will offset the loss of livelihood implicit in tighter ecosystem protection (derived from CRTR lesson #2). In addition, CCRES focused on building alliances with local representatives of federal agencies and with national and international NGOs to influence decision- making and to keep marine resource health and its implications in the public eye (derived from CRTR lesson #3). Project design also placed focus on ensuring the project had an entry point into national, regional or global programs (derived from CRTR lesson #1). Project design, however, did not take into account an additional lesson proposed by IEG in its Implementation Completion and Results report Review (ICRR) that "Development projects that are research-oriented need to guard against capture by researchers who may measure success by research world outputs (publications, promotions, training received, workshops organized) rather than the community-level outcomes sought by agencies such as the Bank".

63. Original Concept and Design: Overall, the project objectives were clearly stated and responsive to government's priorities, while meeting the Bank's goals as set out in the CPF. The components were broadly designed to match the project objectives. Environmental and social factors were adequately incorporated into the design. Relevant risks were identified with appropriate mitigation measures. Project conceptualization and design advanced to build on the success of CRTR and identified opportunities for further investment. Preparation progressed to bridge the "science- to-action" gap but without defining clear strategies as to how these tools would be deployed in practical terms.

64. Interviewees from both sites cited this as an inhibiting factor on partner engagement since the ideas around the models had been presented to them, but the final product was still a long way off. Some felt that an adapted roll-out approach might have worked better whereby deployment would have occurred across the entire project cycle since some tools were more "packaged" and could easily be handed to end-users for immediate use, whereas, other tools were more data-dependent and required a more dynamic, iterative process that included technical training and mentoring. Relatedly, a number of interviewees felt that project design was overly ambitious in attempting to design models and ensure uptake over a five-year implementation timeline. They felt that either CCRES should have been extended to allow for more uptake activities, or that uptake activities should have been the focus of a separate operation entirely.

65. Selectivity framework: While there are clear indicators (13 in total) set out to track progress, the evaluation framework for model selection is unclear. There is no framework to set out why specific tools were selected for development or what methodology was used to select and invest in each of the CCRES models. There were overlapping responsibilities in this regard – between the Component teams; the Technical Steering Committee, whose role was to provide technical oversight, guide strategic direction of activities, and advise on arising topics of interest which could influence project impact; and the Advisory Board, who was responsible for providing guidance on linkages between CCRES activities and results with country programs and to review and approve the recommendations of the Technical Steering Committee. A clear evaluation framework for model selection would likely have helped streamline model development and identify strategic directions for tool deployment and uptake in a more timely manner.

B. KEY FACTORS DURING IMPLEMENTATION

66. Implementation was overall successful and resulted in the achievement of all the objectives set out. Nonetheless, there were inefficiencies during implementation – some subject to PEA control, some subject to World Bank control, some subject to both – that resulted in missed opportunities for CCRES to amplify its results and impact in the short- and longer-term. The most major short-coming in this regard is the relative delay in delivering finalized models in time to apply them as proof of concept with partner projects or programs as set out in the Project Paper (COREMAP-CTI, PRDP, and PEMSEA at the regional level in EAP and WAVES and GEF International Waters Focal Area, IW: Learn at the global level). These implementation inefficiencies stem from four main areas identified below.:

67. Implementation strategy: Broad contours for a strategic approach to achieve the expected outcomes were set out during project preparation and at appraisal. However, these contours were not closely defined in terms of deliverables timeframes or overall project delivery timeline. Some tools to be delivered under CCRES were relatively more advanced in design and/or were easier to prepare, while others required a longer period of investment in terms of scoping, data collection, model design, validation, and packaging during implementation. Moreover, Component leads appear to have worked in isolation with a focus on their individual Component and not in the context of the overarching project goals and development objective. Some seemed to have underestimated the amount of time they would need to invest in focusing on CCRES in addition to attending to other academic responsibilities.

68. Coordination: Project coordination is often challenging in situations where there are a large number of partners and stakeholders representing diverse sectors (public, private, academic, NGOs) across multiple countries. In addition, not all project stakeholders have the same incentive or objective in implementing a project like CCRES: local government coastal planners were interested in having timely and accessible tools that show the value of marine reserve management; private sector showed a willingness to engage, but needed timely information on real-world application of science to better inform their decision-making and investment planning; local communities were interested in understanding their local ecosystem but also in seeing how project benefits would accrue to them in the short-term; and academic partners were interested in the opportunity to further their research activities not necessarily grounded in a practical application to help support sustainable development. Personnel changes in the coordination function at the PEA resulted in inconsistencies in lines of communication to CCUs and with other partners, and may have resulted in

implementation inefficiencies during certain phases of the project. A more autonomous project management and coordination function with the ability to make decisions around project implementation, Component staffing, etc. may have helped ensure better coordination across the board of stakeholders around the world who needed to advance on several project elements and deliverables simultaneously.

69. Expectation Management: There was a robust communications plan in place to maximize the uptake of CCRES models into policy, management and future project design, and increase community awareness and understanding of linkages between the services the coastal and marine ecosystems provide them for their livelihoods and health. However, at a more tactical level as to how all this would be achieved, there seemed to have been inconsistent understanding across Component leads, across CCUs and across project partners and stakeholders more generally. Based on feedback received during ICR interviews, expectation alignment would have been particularly helpful for: (i) Component leaders, some of whom seemed to underestimate the time-commitment involved during implementation; (ii) CCUs, who did not always have sufficient information to share with site partners and instead had to rely on pre-existing relationships in-country to ensure sustained rollout of project activities; and (iii) academic partners, who wanted to be involved with a high-profile project but had multiple other commitments and either delegated work to over-burdened subordinates or to failed engage meaningfully at all.

70. Supervision and governance: Overall CCRES governance was cited by some interviewees as falling short of what was needed. An Advisory Board was established to provide the independent approval process for Component teams' annual work plans and funding allocations, as well as provide advice on how best to link the project outputs to policy and management within national governments and into the World Bank regional projects. Some component leads felt that annual approvals were insufficient when it came to making decisions in strategic shifts in individual components and this resulted, at times, resulted in stalling progress for a number of months. They suggested that bi-annual Board meetings would have better suited the project's circumstances.

III. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

A. QUALITY OF MONITORING AND EVALUATION (M&E)

M&E Design

71. The PDO is formulated as two activities and not specific outcome(s) – and with focus on uptake and influence of the rather ambitious outputs produced under the project. There is a clear alignment and causal relationship between the project and the higher-order objectives and the strategic context (country, regional and sectoral). The M&E system selected a set of indicators to track outputs and outcomes with adequate institutional set up and capacity to support its operation and regular update. Overall it is well designed to facilitate the generation of information that was put to use during implementation.

72. The PDO Indicators and Intermediate-level Results Indicators do not specifically reference the PDO wording "mangrove, seagrass and coral reef ecosystem services": instead the indicators are broad-based, measuring overall ecosystem health, function, and services, which is a better reflection of the models and tools developed under the Project.

73. With regard to attribution, the tools and models developed under CCRES clearly have "the potential to enhance the sustainability of marine-based enterprise and marine spatial planning…" and to contribute to the marine conservation agenda more generally.

M&E Implementation

74. To monitor and measure progress, CCRES established an M&E system to collect data and track progress annually through participant surveys and key informant interviews. M&E implementation was robust, consistent, of high quality and systematically tracked progress towards achievement of the PDO. Where possible, gender disaggregation was mainstreamed across feedback surveys in both project sites.

75. Prior to CCRES implementation there had been varying baseline data available at different project sites. Generally, the baseline was higher in El Nido given that there had been ongoing engagement by development actors in the area dating back to the 1980s. There was less pre-existing data available in Selayar, which required more of an effort in M&E implementation to gather adequate baseline data to track progress in line with the Results Framework.

M&E Utilization

76. The CCRES team utilized M&E results to their fullest and the utilization of M&E data was effective for project monitoring, coordination, and reporting purposes. The component teams, PEA coordinator, and CCUs placed high value data collection and utilization, and while some beneficiary groups found data collection to be excessive, the data acquired had two main positive contributions. Firstly, it allowed for regular (annual) reporting about project activities, presented in clear and accessible Annual Reports, Progress Reports, Advisory Board papers, etc. and available through the CCRES website. Secondly, the regular M&E activities and feedback received during implementation helped incorporate stakeholder feedback into the scoping and design of models and tools under development to make them more user-responsive and tailored to the local context as best possible.

77. Because of the effective approach and the user-focus of the M&E system extensive feedback discussions were carried out and useful information was gathered. Some interviewees noted that local government and community organizations would be interested in more direct feedback around the data gathered, how these efforts could be continued in the future after project closure, and how the data might be used in supporting local coastal management. As such, they may have appreciated a greater focus on capacity building with regard to data collection and analysis under the remit of the project, something that was not foreseen in project (or M&E) design but is worth keeping in mind for future M&E engagements, especially in geographies or sectors where there is a relative paucity of baseline data available.

Justification of Overall Rating of Quality of M&E

78. Overall M&E is rated Substantial. The M&E system was, on the whole, adequately designed and satisfactorily implemented. The utilization of M&E data was effective for project monitoring, coordination, and reporting purposes. These reports present the vast activities that had been undertaken across both project sites and beyond, for example in regional and global policy forums. They show clearly the effort invested by Component teams, the PEA, CCUs, and partners more generally, and track progress closely to show CCRES impact. Moreover, they provide a retrospective

setting out how CCRES either met or surpassed the targets established in the PDO and intermediate level results indicators throughout implementation.

B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

79. Environmental and Social Safeguards. CCRES triggered Operational Policies (OPs) for Environmental Assessment (OP 4.01), Natural Habitats (OP 4.04), Indigenous Peoples (OP 4.10) and Involuntary Resettlement (OP 4.12). It was classified as Category B, primarily out of a concern over potential social impacts that might arise from the potential restriction of access to resources by local communities in any plans developed under the MSP or MPA models. The only safeguards issue of note during implementation was the requirement for access to appropriate guidance reflecting the World Bank's OPs for end users.

80. Originally it had been envisaged to use COREMAP and PRDP risk management instruments as CCRES core instruments. However, since CCRES was designed to engage with other projects or programs beyond COREMAP and PRDP, additional guidelines were developed and packaged with all tools to cover the work and roll out through all end users. The project safeguards team supported the PEA in preparing simplified safeguard guidelines which were disseminated with all project tools and share with end users. Aside from one instance of Moderately Satisfactory pending the finalization of these guidelines, CCRES was consistently rated Satisfactory in terms of safeguards performance throughout implementation.

81. Financial Management. The financial management performance rating across implementation was consistently rated Satisfactory and cumulative disbursements were in line with the expected disbursement rate. The University of Queensland's staff was well-qualified to meet the fiduciary standards required for projects financed through the World Bank and throughout implementation the assessed risk rating remained Low.

82. Procurement. Procurement performance remained rated Satisfactory. Procurement was undertaken in accordance with agreed policies and procedures as delineated in the Grant Agreement. Several major contracts were completed on schedule and within costing estimates.

C. BANK PERFORMANCE

Quality at Entry

83. Overall, the Bank team ensured that the Project was of high strategic relevance and was responsive to the development priorities of the government and the Bank. And through project preparation and appraisal process the Bank also played an important role in ensuring that the project design was by in large sound and the project could achieve its development objectives. Preparation and appraisal of technical aspects were carried out and the fiduciary and safeguards arrangements were also adequate. M&E arrangements at entry were adequate albeit described at a high level. Project design identified its vision and ambitions in filling in the gaps identified in CRTR . Project concept appears to have relied heavily on assumptions of knowledge gaps identified during CRTR and proceeded to design an ambitious project with distinct components without a fuller presentation about how all the individual parts fit together to support conservation and contribute to environmentally and socially sustainable economic development for rural coastal communities in the project sites.

84. In hindsight design activities could have more seriously considered comparative advantages of individual project players to determine who was best-placed to play a leading role in delivering on the “science-to-action” demonstration with mechanisms in place to ensure delivery along a predetermined timeline. Integrating these design aspects upfront could have amplified CCRES impact in the region by providing timely scientific input to COREMAP-CTI, PRDP, WAVES, PEMSEA, and other relevant initiatives in the region to show impact at scale.

Quality of Supervision

85. The Bank team has maintained a focus on achievement of the PDO and development impact. It also facilitated the successful implementation of the M&E system to systematically track the progress, which contributed to effective coordination and reporting. Bank implementation support missions were promptly conducted and provided targeted support for most time of the project duration. The implementation missions were well staffed and have proactively identified issues and worked closely with the counterparts on address them. The supervision of safeguards and fiduciary aspects was of good quality. The project experienced some inefficiencies due to the turnover rate of task team leaders. For the initial years of project implementation, more hands-on supervision by the World Bank team, in conjunction with a defined strategy for project implementation between the PEA and all partners, may have helped advance tool finalization and move more quickly towards uptake activities. Following team leadership changes during the mid-point of implementation a more hands-on and proactive field-based supervision was evident. There was acknowledgment at the time of the MTR (October 2016) that, while overall implementation was progressing in line with what had been set out in the Project Paper, a subset of Project products would either need to accelerate final production and delivery for completion, be adjusted, or dropped. As a result, progress accelerated and no restructuring was necessary.

Justification of Overall Rating of Bank Performance

86. Based on the factors outlined above, World Bank performance is rated **Moderately Satisfactory**. While CCRES achieved all of its objectives, there were inefficiencies in design that could have been remedied by more fully integrating CRTR ICR and ICRR lessons learned. Ambitious design with broad geographic and partner scope and a PEA with limited experience in implementing development-focused projects required careful supervision. A more hands-on approach by the Bank could have helped ensure project implementation progressed along a tighter timeline to avoid important missed opportunities for CCRES to drive “science-to-action".

D. RISK TO DEVELOPMENT OUTCOME

87. The principal risk to development outcome is the sustainability of model uptake beyond project closure, which is rated substantial. While there was a concerted campaign to promote uptake during the last two years of project implementation, it is unclear, based on the data currently available, the extent to which uptake for individual tools has been institutionalized and will be further adopted and applied going forward. This was a core focus of supervision during Years 4 and 5 – to identify a set of platforms to adopt and house the models developed to ensure sustainability and continue promotion of uptake. In this regard, UQ, UPMSI and PEMSEA, amongst others, play a critical role. Informally, a number of partner institutions have agreed to continue applying CCRES models in their work, and UQ continues to promote uptake activities through targeted engagement in the academic and policy spheres.

88. As a general principle based on interviewee responses, for provincial and municipal coastal planners who are aware of the tools and have received training, they are likely to apply CCRES models and tools for their intended use which will result in the longer-term institutionalization of models and enhanced sustainability of marine spatial planning and marine-based enterprise.

IV. LESSONS AND RECOMMENDATIONS

Lesson 1: Multi-partner, multi-country, multi-stakeholder projects are complex to design and challenging to implement. Recommendation: Project design should be set realistically to what can be achieved in a five-year timeline and adequate attention should be given to World Bank implementation support to ensure multi-party development projects progress on schedule. Governance structures need to be adaptive to enable quick decision-making. The rights, responsibilities and expectations of partners should be codified in contracts or terms of reference to minimize delivery delays and avoid disagreements, such as around intellectual property. A selectivity framework for activities to be undertaken during Project implementation should be established upfront to evaluate and assess what activities are viable under the resource and time commitments available.

Lesson 2: CCRES did not fully bridge the "science-to-action" gap. The lessons from the CRTR project were not universally taken into consideration in project design and several respondents felt that CCRES provided greater value to the scientific community than to the local community.
Recommendation: The pursuit of development outcomes should remain at the core of research and conservation efforts financed as a global public good. World Bank teams should keep this squarely in focus during project design, and project management and supervision functions should maintain this focus during implementation. Development projects should be implemented by agencies with a comparative advantage in project management; research expertise can be funded and procured as part of project financing but should not be the core remit of the PEA. Additionally, the expectations of local communities as to what might be achieved through project-financed interventions should also be managed carefully.

Lesson 3: Bottom-up approaches are welcomed by stakeholders but may be insufficient to achieve longer-term institutionalization. Respondents welcomed the dedicated capacity building efforts that accompanied the rollout, which: (i) helped identify and define community aspirations and community development plans (with community ownership); and, (ii) catalyzed a mindset change that allowed MPAs to be seen as a foundation of sustainable enterprise. Nonetheless, absent simultaneous top-down interventions focused on institutionalizing tools at higher levels of governance through targeted outreach efforts tailored to specific audiences, the benefits of scaling-up these initiatives may not accrue.
Recommendation: Continue engaging local communities and leverage their positive experience in promoting uptake with provincial and national governments, but also target uptake efforts at provincial, national, and regional governance structures to aid institutionalization and showcase the positive scalable and replicable impact that the innovative models developed under CCRES.

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ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS INDICATORS

A.1 PDO Indicators

Objective/Outcome: Design innovative models for valuing mangrove, seagrass, and coral reef ecosystem services

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Innovative models developed at two or more sites by the project, demonstrating explicit links between ecosystem health, the value of ecosystem services, and their distribution among stakeholders	Number	0.00 30-Sep-2013	2.00 31-Dec-2018		4.00 31-Dec-2018

Comments (achievements against targets):

Achieved (200%). The original target was exceeded because the research team identified additional opportunities to fill knowledge gaps around ecosystem health and protecting coastal biodiversity during the course of their scoping and design activities at both pilot sites. Data source: Review of CCRES toolkit (available at: https://ccres.net/resources/view/ccres-toolkit-guide) and information provided by PEA.

The Unit of Measure is 'number of sites where models are developed'. The baseline is zero and end of project target is 2 representing Selayar and El Nido, the two original project sites in the project design. As of December 3, 2018, the project has developed 4 models. 1 macro tool

piloted at two sites – comprised of 5 sub-tools, 2 of which have been piloted at El Nido and Selayar and 1 of which has been piloted elsewhere in the Philippines (Fish SPACE).

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Develop new or improve existing business models directly or indirectly linked to coastal marine zone ecosystem services in at least two sites	Number	0.00 30-Sep-2013	2.00 31-Dec-2018		2.00 31-Dec-2018

Comments (achievements against targets):

Achieved (100%). Data source: Review of CCRES toolkit (available at: https://ccres.net/resources/view/ccres-toolkit-guide) and CCRES site reports for Selayar and El Nido (available at: https://ccres.net/resources/category/site-reports)

The project successfully developed the Ecosystem-Based Business Development (EbBD) Model and ECO- BIZ Program to foment and support establishment of new coastal ecosystem based business models. The indicator unit of measure is 'number of sites with business models developed'. As of December 2018, both models have been developed and tested in El Nido and Selayar.

Objective/Outcome: Support uptake of innovative models for valuing ecosystem services in selected coastal communities

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Project developed models	Number	0.00	5.00		19.00

and knowledge products inform the design of regional and national projects, development plans or policies and community based coastal resources management plans.		30-Sep-2013	31-Dec-2018		31-Dec-2018

Comments (achievements against targets):

Achieved (380%). Original target exceeded due to outreach and communications campaign as part of uptake activities which increased demand among targeted stakeholders. Data source: Review of CCRES Progress Reports and Annual Reports. Available at https://ccres.net/resources/

As of December 3, 2018, the project has developed tools that have been utilized by 19 projects/plans, as follows:

1. Largely at the behest of the Ministry of Marine Affairs and Fisheries, WWF-ID have applied MSP toolkit in 17 locations / projects.
2. The COREMAP-CTI project has requested and received a training workshop on use of the tools by CCRES. Further, the Reef React tool on resilience has informed the collaborative venture led by COREMAP, with partnership from CCRES to develop the National Coral Reef Health Index which has been applied to all COREMAP monitoring data on coral reefs.
3. Government of Palau is planning to use the MPA toolkit in September 2018.
4. The PCSD plans to use the MPA toolkit to review the contribution of existing MPAs to fisheries in late 2018.
5. Selayar local community has applied BdBD and MFMO to address the waste management in the town
6. Parak Village community in Selayar has applied FishCollab to prepare community- designed Marine Protected Areas and management plan that and submitted for recognition and support by the provincial government.
7. Bali Seafood International's Founder Jerry Knecht has returned to Selayar to commence a more detailed assessment of the site for BSI's second Fisheries Management Centre on Selayar, following the successful launch of their first FMC in Sumbawa.
8. RARE has planned to apply Marine planning tools in Belize, Honduras and Mexico in the Caribbean.
9. The Gulf and Caribbean Fisheries Institute (GCFI) and the U.S. National Oceanic and Atmospheric Administration (NOAA) organised an MPAConnect training workshop in Saba for MPA managers of 10 Caribbean countries using MPA Size Optimisation tool.

10. Haribon Foundation, Partner of the DENR/UNDP Smart Seas PH Project, has used Fish SPACE to evaluate marine reserve design and fisheries management initiatives in Lanuza Bay, Surigao del Sur, Philippines.
11. Smart Seas PH is using Lanuza Bay as a model site to roll out the MPA design tools in other Marine Key Biodiversity Areas such as the Davao Gulf and the Verde Island Passage.
12. The Palawan Council for Sustainable Development and WWF Palawan are using Fish SPACE and the MPA Size and Placement Optimization Tools to support MPA design in Cluster 5 municipalities in north-eastern Palawan, which includes El Nido, Linapacan, Taytay, Dumaran, Roxas and Araceli.
13. Fish SPACE and the MPA Size and Placement Optimization tools were used in Oriental Mindoro, Lanuza Bay, Palawan and Batangas.
14. Healthy fisheries through marine reserves policy brief and MPAs Placement Optimisation and Size Optimisation tools were applied by the local government to plan MPAs in 3 sites in Indonesia (Seram, Sulawesi Tenggara and Simeulue, Aceh) and one in the Philippines (Tanon Strait Protected Seascape).
15. The Zoological Society of London working in the Panay and Negros islands, and the Macajalar Bay Development Alliance in Misamis Oriental have developed work plans to use the MPA design tools.
16. The Management Board of the El Nido-Taytay Resource Protected Areas is considering using Fish SPACE in the planning of protected areas management.
17. The government of Indonesia is funding a LIPI project applying FishCollab and EbBD tools in 5 locations across the country in 2019 to develop effective interventions for tackling poverty in fishing communities.
18. A proposal involving the uptake of SESAMME and SYSTORY is currently being prepared for a tender entitled ‘Develop National Ridge to Reef R2R) Diagnostic Reports’. The close of the tender submission is 4 Jan 2019.
19. A proposal (to be submitted to USAID) is currently being developed by PSU and the Business team on Marine Waste Recycling involving the application of business and behavioral change tools.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Plans or projects to reduce stress and maintain value of	Number	0.00 30-Sep-2013	5.00 31-Dec-2018		18.00 31-Dec-2018

eco-system services					

Comments (achievements against targets):

Achieved (360%). Original target exceeded due to outreach and communications campaign as part of uptake activities which increased demand among targeted stakeholders. Data source: Review of CCRES Progress Reports and Annual Reports. Available at: https://ccres.net/resources/

Number of projects/plans promoting stress reduction based on models.

1. WWF and MMFA have applied MSP toolkit in 27 locations across Indonesia.
2. COREMAP has used the MPA toolkit to develop the National Coral Reef Health Index, which was applied to all COREMAP monitoring data on coral reefs.
3. Government of Palau is currently using the MPA toolkit.
4. Selayar local community has applied BdBD and MFMO to address the waste management in the town.
5. Parak Village community in Selayar applied FishCollab to prepare community- designed MPAs and management plan submitted for recognition and support by the provincial government.
6. Bali Seafood International's Founder Jerry Knecht has returned to Selayar to commence a more detailed assessment of the site for BSI's second Fisheries Management Centre on Selayar, following the successful launch of their first FMC in Sumbawa.
7. RARE has planned to apply Marine planning tools in Belize, Honduras and Mexico in the Caribbean.
8. The Gulf and Caribbean Fisheries Institute (GCFI) and the U.S. National Oceanic and Atmospheric Administration (NOAA) organised an MPAConnect training workshop in Saba for MPA managers of 10 Caribbean countries using MPA Size Optimisation tool.
9. Haribon Foundation, Partner of the DENR/UNDP Smart Seas PH Project, has used Fish SPACE to evaluate marine reserve design and fisheries management initiatives in Lanuza Bay, Surigao del Sur, Philippines.
10. Smart Seas PH is using Lanuza Bay as a model site to roll out the MPA design tools in other Marine Key Biodiversity Areas such as the Davao Gulf and the Verde Island Passage.
11. The Palawan Council for Sustainable Development and WWF Palawan are using FishSPACE and the MPA Size and Placement Optimization Tools to support MPA design in Cluster 5 municipalities in North Eastern Palawan, which includes El Nido, Linapacan, Taytay, Dumaran, Roxas and Araceli.
12. Fish SPACE and MPA Size and Placement Optimization tools were used in Oriental Mindoro, Lanuza Bay, Palawan and Batangas.

13. The Zoological Society of London, working in the Panay and Negros islands, and the Macajalar Bay Development Alliance in Misamis Oriental have developed work plans to use the MPA design tools.
14. The Management Board of the El Nido-Taytay Resource Protected Areas is considering using Fish SPACE in the planning of protected areas management.
15. The government of Indonesia is funding a LIPI's project applying FishCollab and EbBD tools in five locations across the country in 2019 to develop effective interventions for tackling poverty in fishing communities.
16. A waste bank initiative has been established in Parak community at Selayar with the support of LIPPI following the combined application of MFMO, EbBD and W2E tools.
17. A proposal involving the uptake of SESAMME and SYSTORY is currently being prepared for a tender entitled 'Develop National Ridge to Reef R2R) Diagnostic Reports'. The close of the tender submission is 4 Jan 2019.
18. A proposal (to be submitted to USAID) is currently being developed by PSU and the Business team on Marine Waste Recycling involving the application of business and behavioral change tools.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Direct project beneficiaries	Number	0.00 30-Sep-2013	1000.00 31-Dec-2018		3001.00 31-Dec-2018
Female beneficiaries	Percentage	0.00	30.00		47.00

Comments (achievements against targets):

Achieved (300%). The target was exceeded due to broad scoping and community engagement exercises, especially in model development for the tools related to (i) behavior change and (ii) systems thinking which engaged project beneficiaries through forums such as community

workshops and focus group discussions. Data source: Review of CCRES Annual Report 2018, page 41. Available at: https://ccres.net/resources/view/2018-annual-report

As of December 3, 2018, an estimated 3,001 beneficiaries (47% women) had attended CCRES events (workshops, training courses, stakeholder forums, focus groups, closing visits and conference side-events) since the project began.

A.2 Intermediate Results Indicators

Component: 1. Quantifying Value and Market Potential of Coral Reef, Seagrass, and Mangrove Ecosystem Services

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
At least three models of ecosystem function and services valuation developed	Number	0.00 30-Sep-2013	3.00 31-Dec-2018		4.00 31-Dec-2018

Comments (achievements against targets):

Achieved: 133%. The original target was exceeded because the research team identified additional opportunities to fill knowledge gaps around ecosystem health and protecting coastal biodiversity during the course of their tool scoping and design activities at both pilot sites.

Data source: Review of CCRES toolkit (available at: https://ccres.net/resources/view/ccres-toolkit-guide) and information provided by PEA.

The unit of measure for this indicator is "number of models of service or function developed." As of December 2018, the project developed 4 models, one of which is comprised of 5 sub-models, and piloted them at the two project sites, El Nido and Selayar:

1. Coastal Protection Tool
2. Reef React (Model)

3. Food Web model (outcomes distributed as a Policy Brief: Priority reefs for conservation and fisheries replenishment)
4. MPA toolkit:

- MPA Policy brief: Healthy fisheries through marine reserves
- MPA Placement Optimisation Tool
- MPA Size Optimization Tool
- Fish SPACE
- Educational tool for marine design

These 4 tools enable coastal planners and policymakers to make more evidence-based robust decisions on the relative importance of reefs for coastal protection and to design marine plans that consider the area to be set aside for reserves, their size, and optimal design in order to sustain and rebuild fisheries and to protect coastal biodiversity.

These tools have been implemented in 27 locations across 34 Indonesian provinces by WWF Indonesia and MMAF.

In addition, a policy brief was created to communicate the value of seagrass beds - Policy Brief: Reduce pathogenic bacteria through seagrass protection.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Innovative, comprehensive decision support systems for marine reserve design to optimize management objectives developed	Number	0.00 30-Sep-2013	2.00 31-Dec-2018		5.00 31-Dec-2018

Comments (achievements against targets):

Achieved: 250%. The original target was exceeded because additional models for marine spatial planning were identified during project implementation to address some of the site-specific issues that became apparent during model scoping and design activities.

Data source: Review of the CCRES Tools & Training Guide, available at: https://ccres.net/resources/view/ccres-toolkit-guide

The unit of measure for this indicator is "number of decision support systems for marine reserve design (piloted in year 3, operational in year 4 and applied in year 5)".

The MPA toolkit developed under CCRES is an operational system comprising 5 tools that when use together provide an innovative and comprehensive support system to marine reserve design. The 5 tools in the MPA toolkit are: (i) MPA placement tool; (ii) MPA size optimization tool; (iii) Fish SPACE (Fisheries for Sustaining People's Access through Conservation and Equitable Systems); (iv) Health fisheries through marine reserves policy brief; and (v) Educational tool for marine design.

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Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Planning framework that incorporates models of ecosystem functions and services, including coastal defense, and decision support systems developed in response to stakeholder demand (e.g., local gov)	Number	0.00 30-Sep-2013	2.00 31-Dec-2018		9.00 31-Dec-2018

Comments (achievements against targets):

Achieved: 450%. The original target was exceeded because of demand generated through CCRES outreach and uptake activities, especially leveraging pre-existing relationships of key project partners which enabled uptake of CCRES tools in marine planning frameworks under design in Indonesia, the Philippines, regionally in East Asia, and globally. For more information, see below.

Data source: Review of CCRES Annual Report 2018, CCRES Site Reports from Selayar and El Nido, and CCRES Progress Reports (all available at: https://ccres.net/resources/) as well as uptake-related information received from the University of Queensland.

As of December 3, 2018, CCRES-developed tools had been used to inform the design of marine biodiversity protection frameworks in as follows:

1. The MPA toolkit has been applied In 27 locations across Indonesia and Palau to support decision-making in response to demand from stakeholders.

2. RARE has planned to apply marine planning tools in Belize, Honduras and Mexico in the Caribbean.

3. Haribon Foundation, Partner of the DENR/UNDP Smart Seas PH Project, has used Fish SPACE to evaluate marine reserve design and fisheries management initiatives in Lanuza Bay, Surigao del Sur, Philippines.

4. Smart Seas PH is using Lanuza Bay as a model site to roll out the MPA design tools in other Marine Key Biodiversity Areas such as the Davao Gulf and the Verde Island Passage.

5. The Palawan Council for Sustainable Development and WWF Palawan are using Fish SPACE and the MPA Size and Placement Optimization Tools to support MPA design in Cluster 5 municipalities in north-eastern Palawan, which includes El Nido, Linapacan, Taytay, Dumaran, Roxas and Araceli.

6. Fish SPACE and MPA Size and Placement Optimization tools were used in Oriental Mindoro, Lanuza Bay, Palawan and Batangas.

7. Healthy fisheries through marine reserves policy brief and; MPAs Placement Optimisation and Size Optimisation tools were applied by the local government and NGOs to plan MPAs in 3 sites in Indonesia (Seram, Sulawesi Tenggara and Simeulue, Aceh) and one in the Philippines (Tanon Strait Protected Seascape).

8. The Zoological Society of London, working in the Panay and Negros islands, and the Macajalar Bay Development Alliance in Misamis Oriental have developed work plans to use the MPA design tools.

9. The Management Board of the El Nido-Taytay Resource Protected Areas in the Philippines will consider using Fish SPACE in the planning of protected areas management.

Component: 2. Community Innovation in Capturing Benefits from Ecosystem Services & Enhancing Climate Resilience

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Develop and analyze system maps for each site detailing interactions between specific ecosystem services and social-economic sectors	Number	0.00 30-Sep-2013	4.00 31-Dec-2018		5.00 31-Dec-2018

Comments (achievements against targets):
Achieved: 125%. Original target exceeded due to interest generated from local communities and project partners in designing maps to illustrate impacts of socio-economic on local ecosystem health.

Data source: Review of CCRES Annual Reports 2015, 2017 and 2018 (available at: https://ccres.net/resources/category/annual-reports) and CCRES Highlights & Achievements Report, October 2018 (available at: https://ccres.net/resources/category/progress-reports).

As of December 3, 2018, the project has developed and applied 5 system maps, as follows:

- Food Security System Map: 36 maps applied by the El Nido Foundation.
- Water Pollution System Map: 15 maps applied by Palawan State University.

- Fish Catch Decline System Map: 16 by the Palawan Council for Sustainable Development.
- Mangrove Loss System Map: 19 by the Palawan Council for Sustainable Development.
- Reef Fisheries Decline System Map: 17 by the Bogor Agricultural University.

The system maps have been developed for 5 socio-ecological problems using SESAMME tool:

Philippines:

1. Food Security: 36 Focus Group Discussions (FGD) by El Nido Foundation
2. Water Pollution: 15 FGD by Palawan State University
3. Fish Catch Decline: 16 FGD by Palawan State University
4. Mangrove Loss: 19 FGD by Palawan Council for Sustainable Development

Indonesia:

1. Reef Fisheries Decline: 17 FGD by IBP-Bogor (Bogor Agricultural University)

For each problem, individual maps were developed through focus group discussions (FGD) with stakeholder groups in El Nido and Selayar; then combined by the CCRES project teams into one systems map for each problem, resulting in 5 overall maps

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Nurture new and/or existing businesses that offer products and services linked to ecosystem services in at	Number	0.00 30-Sep-2013	2.00 31-Dec-2018		2.00 31-Dec-2018

least two sites					

Comments (achievements against targets):

Achieved: 100%. Data source: Review of CCRES toolkit (available at: https://ccres.net/resources/view/ccres-toolkit-guide) and CCRES site reports for Selayar and El Nido (available at: https://ccres.net/resources/category/site-reports)

As of December 3, 2018, the project delivered two business models: Ecosystem-based Development (EbBD) Model and ECO-BIZ Program. Both were piloted in Selayar and El Nido.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Develop affordable decision toolkit for use by stakeholders that is applicable across all sites	Number	0.00 30-Sep-2013	1.00 31-Dec-2018		2.00 31-Dec-2018

Comments (achievements against targets):

Achieved: 200%. The original target was exceeded because of the development of the Systems Analysis toolkit as a response to beneficiary feedback and stakeholder input during project implementation (design and scoping activities) to complement the project focus on forging community innovation in capturing benefits from ecosystem services and enhancing climate resilience. Data source: Review of CCRES Tools & Training Guide (available at: https://ccres.net/resources/category/ccres-tools)

As of December 3, 2018, the project delivered 2 toolkits that can be readily applied by stakeholders across any geographic location with minimal expense:

1. Business toolkit with 2 tools: (i) EbBD and (ii) Eco Biz and;

2. System Analysis toolkit comprising 3 tools: (i) SESAMME, (ii) SYSTORY, and (iii) The Systems Simulation Tool.

Each toolkit is affordable and freely available and can be used by stakeholders to address coastal ecosystems services challenges and business development applicable to any site.

Component: 3. Promoting Behavioral Change through Outreach, Decision Support, and Regional Learning

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Information and knowledge products shared with the Strategic Partnership for East Asian Seas, governments, technical networks and existing projects	Number	0.00 30-Sep-2013	40.00 31-Dec-2018		50.00 31-Dec-2018

Comments (achievements against targets):

Achieved: 125%. Over the five-year duration of project implementation, fifty (50) CCRES outreach and information-sharing & dissemination events took place. These were targeted at policy-makers, technical and academic networks, government agencies, and NGO partners. Outreach and learning activities took place across all geographies: locally at pilot sites, nationally in Indonesia and the Philippines, regionally in East Asia, and a marine conservation conferences globally.

Data sources: Review of Annual Reports 2017 and 2018 and CCRES Highlights & Achievements (Oct. 2018), all available at: https://ccres.net/resources/

For example, information-sharing and dissemination activities during 2018 included:

1. Tools training workshop at Makassar, Indonesia, February 2018

2. Tools training workshop at Tagatay, Philippines, April 2018
3. The third Targeted Regional Workshop for Global Environment Facility (GEF) International Waters (IW) Projects from east Europe and Asia-Pacific (April-May) and the First Annual Asia-Pacific Regional Network meeting (May 2018)
4. The Asia-Pacific Coral Reef Symposium at Cebu, the Philippines, in June 2018
5. Site exit/closing visit for Selayar Indonesia, July 2018
6. Our Ocean Conference, Bali #OOC2018, October 2018
7. International Waters Conference #GEFIWC9, November 2018
8. Site exit/closing visit for El Nido/Philippines, November 2018
9. PEMSEA's EAS Congress 2018 #EASCongress2018, November 2018
10. CCRES eNews, four editions in 2018: (March, June, September and December).

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Stakeholders perceive benefits in incorporating information on ecosystems services into the decision-making process	Percentage	0.00 30-Sep-2013	15.00 31-Dec-2018		97.00 31-Dec-2018

Comments (achievements against targets):

Achieved: 650%. The original target was exceeded because of strong beneficiary engagement and stakeholder involvement in the project design and uptake phases.

Data source: Review of CCRES Annual Report 2018 (page 47) citing participant exit surveys from outreach events in February 2018 (Indonesia) and April 2018 (The Philippines). Available at: https://ccres.net/resources/category/annual-reports

As of December 31, 2018 stakeholder surveys at two outreach events - February 2018 (Indonesia) and April 2018 (The Philippines) - assessed that approximately 97% of participants agreed or strongly agreed that they perceived benefits in using information on ecosystem services to support decision-making following their involvement with the CCRES project.

A. KEY OUTPUTS BY COMPONENT

Objective/Outcome 1: To design innovative models for valuing mangrove, seagrass and coral reef ecosystem services	
Outcome Indicators	1. Innovative models developed at two or more sites by the project, demonstrating explicit links between ecosystem health, the value of ecosystem services, and their distribution among stakeholders. 2. Develop new or improve existing business models directly or indirectly linked to coastal marine zone ecosystem services in at least two sites.
Intermediate Results Indicators	1. At least three models of ecosystem function and services developed. 2. Innovative, comprehensive decision support systems for marine reserve design which help optimize management objectives developed. 3. Planning frameworks that incorporate models of ecosystem functions and services, including coastal defense, and decision support systems developed in response to stakeholder demand (e.g. local government).
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	1. the Reef React model, to help guide policy and management interventions to reduce negative impacts of climate change or human activities; 2. the Coastal Protection model, which assesses coral reef ability to protect shorelines and enables planners to determine which reefs best protect key coastal infrastructure and communities; 3. the FoodWeb policy brief contains guidelines for prioritizing which reefs are best suited to marine biodiversity conservation, compared with those best used for reef fisheries;

	4. the MPA Toolkit, a suite of five tools (MPA placement optimization tool; MPA size optimization tool; Fish SPACE; Policy brief: Healthy fisheries through marine reserves; and the Educational Tool for Marine Design) designed to enable coastal planners and policymakers make decisions on the total coverage, number, placement, and size of MPAs in order to sustain and rebuild fisheries and to protect coastal biodiversity.
Objective/Outcome 2: Support the uptake of innovative models for valuing mangrove, seagrass and coral reef ecosystem services	
Outcome Indicators	1. Project developed models and knowledge products inform the design of regional and national projects, development plans or policies and community based coastal resources management plans. 2. Plans or projects to reduce stress and maintain value of eco-system services (GEF: IW Indicator).
Intermediate Results Indicators	1. Planning framework that incorporates models of ecosystem functions and services, including coastal defense, and decision support systems developed in response to stakeholder demand (e.g., local gov).
Key Outputs by Component (linked to the achievement of the Objective/Outcome 2)	1. The MPA toolkit has been applied In 27 locations across Indonesia (and regionally in Palau) to support decision-making in response to demand from stakeholders. 2. Smart Seas PH is using Lanuza Bay as a model site to roll out the MPA design tools in other Marine Key Biodiversity Areas such as the Davao Gulf and the Verde Island Passage. 3. The government of Indonesia is funding a LIPI's project applying FishCollab and EbBD tools in five locations across the country in 2019 to develop effective interventions for tackling poverty in fishing communities. 4. The Palawan Council for Sustainable Development and WWF Palawan are using FishSPACE and the MPA Size and Placement

	Optimization Tools to support MPA design in Cluster 5 municipalities in North Eastern Palawan, which includes El Nido, Linapacan, Taytay, Dumaran, Roxas and Araceli.

ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

A. TASK TEAM MEMBERS

Name	Role
Preparation	
Marea Hatziolos	Task Team Leader (Preparation)
Harideep Singh	Task Team Leader (Appraisal)
Noel Sta. Ines	Procurement Specialist(s)
Stephen Paul Hartung	Financial Management Specialist
Juan Martinez	Social Specialist
Josefo Tuyor	Social Specialist
Supervision/ICR	
Cary Anne Cadman	Task Team Leader
Rene SD. Manuel	Procurement Specialist(s)
Stephen Paul Hartung	Financial Management Specialist
Kevin McCall	Team Member
Ross James Butler	Social Specialist
Jeremy Webster	Team Member
Agustina Parwitosari	Environmental Specialist
Noreen Follosco	Consultant
Andrew Harvey	Consultant
Elena Strukova	Consultant

A. STAFF TIME AND COST

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US$ (including travel and consultant costs)
Preparation		
FY12	2.375	17,160.85
FY13	11.524	78,652.50
FY14	5.100	27,193.92
Total	**19.00**	**123,007.27**
Supervision/ICR		
FY15	5.859	18,821.86
FY16	8.070	35,512.70
FY17	3.962	45,965.05
FY18	3.313	36,964.91
FY19	2.400	79,297.00
Total	**23.60**	**216,561.52**

ANNEX 3. PROJECT COST BY COMPONENT

GEF Financing (USD)	2014	2015	2016	2017	2018 (Jul_Dec)	Total GEF	Total direct cost
Component 1	584,315.00	341,566.00	211,414.00	266,119.00	2,424.00	1,405,838	1,405,838.00
Component 2	230,301.00	477,626.00	219,426.00	420,142.00		1,347,495	1,347,495.00
Component 3	195,561.00	193,280.00	189,159.00	184,741.00		762,741	762,741.00
Component 4	69,053.00	87,547.00	48,814.00	206,259.00	189,884.00	601,557	601,557.00
Total GEF grant (USD)	**1,079,230.00**	**1,100,019.00**	**668,813.00**	**1,077,261.00**	**192,308.00**	**4,117,631**	4,117,631.00

University of Queensland Contribution (AUD)	2014	2015	2016	2017	2018	2019	Cumulative
Component 1	361,000	153,000	203,250	90,000	12,723		819,973
Component 2	168,000	55,000	116,547	169,462	29,308		538,317
Component 3	157,788	181,292	56,582	121,364	- 20,145		496,880
Component 4	11,475	- 15,399	7,768	20,302	32,777	14,506	71,429
Total UQ Contribution (AUD)	**698,263**	**373,893**	**384,147**	**401,128**	**54,662**	**14,506**	**1,926,599**

ANNEX 4. EFFICIENCY ANALYSIS

Capturing Coral Reef and Related Ecosystem Services (CCRES) Economic Assessment

Prepared by: Elena Strukova, Ph.D.
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Main Report

1. Despite the fact that there was no economic assessment at the time the Project was appraised, an ex-post cost-benefit analysis was carried out for purposes of this ICR. The most time and resource intensive activity under the CCRES was data collection and tools development that was supported by target group discussions in two pilot sites in Indonesia and Philippines. These activities were dominant up to the end of 2017, which is two years longer than envisaged by the Project Information Paper. Subsequently, launching of the project tools started in the end of 2017 and continued in 2018 when the project concluded. Therefore actual improvements of local coral reefs ecology with a positive impact on fishery, tourism or coastal development could not be assessed as a part of project implementation. However, potential benefits from project implementation are plausible and were estimated based on the relevant literature review that reflects positive impact attributed to sustainable coral reefs use in the Coral Triangle.

2. This analysis shows that the Project potentially could generate substantial economic returns in Indonesia pilot site under conservative assumptions and for different scenarios . Potential benefits in Philippines are estimated significantly lower. For benefit-cost analysis, we compare the actual project costs (both the GEF grant and University of Queensland contribution) with their estimated economic benefits for the first 20 years, both discounted to 2013 (the baseline year) with 6% discount rate. The potential benefits originate from the increased provisioning value of coral reefs in the pilot areas after improvements of decision-making process on the level of both regulators and local communities. The economic benefits are based on the incremental benefits of the communities from fishing after application of new tools, information, etc. to prevent degradation of coastal ecosystems and to improve efficiency of the local business that operates sustainably. The project benefits are contingent on willingness of local communities to use the new tools developed under the CCRES.

3. Costs are presented by the actual financial project costs discounted by 6 percent -- US$ 5.5 million (total direct project cost) including the GEF grant - US$3.8 million. Under the optimistic scenario of utilization of the tools developed under the CCRES, the Net Present Value for the entire project is estimated to be US$ 20.8 million (at a discount rate of 6 percent), and the Internal Rate of Return is 28 percent, with the potential cost of environmental degradation of coral reefs reduction in Indonesia dominant in their overall contribution to the Project

benefits. The Project BCR in the optimistic scenario is estimated at 4.8. Under the pessimistic scenario of the tools use, the Net Present Value for the entire project is estimated to be US$4.7 million (at a discount rate of 6 percent), with the Internal Rate of Return 13 percent, where the potential cost of environmental degradation of coral reefs reduction in Indonesia still economically viable across all scenarios. The Project BCR in the pessimistic scenario is estimated at 1.9. The robustness of these results is verified by sensitivity analysis. Different discount rates (3, 6, and 10 percent) are applied. In addition, some benefits cannot be quantified, such as those of potential benefits of the tools application on the regional, national levels in other countries, and overall capacity building in the local communities involved in the project implementation.

Table 1: Results of Cost-Benefit Analysis for all Direct Project Costs between 2013 and 2033 (US$ Million)

	Optimistic incremental scenario		Pessimistic incremental scenario	
	NPV	BCR	NPV	BCR
Discount Rate 3%	31.8	6.5	8.8	2.5
Discount Rate 6%	20.8	4.8	4.7	1.9
Discount Rate 10%	11.9	3.4	1.5	1.3
IRR	28%		13%	

Note: NPV = Net Present Value; IRR = Internal Rate of Return ; BCR= Benefit-Cost Ratio.

4. **Project impact on beneficiaries.** The Project positively impacted the socio-economic conditions of beneficiary households. Some communities in Selayar Indonesia started to implement community-based tourism through homestays, in El Nido, Philippines the CCRES generated some small sustainable business ideas, like using coconut as an alternative to mangrove wood; eco-tourism in the mangroves; cultivating giant bamboo to reduce logging in native forests; and supplying ornamental native flowers to the tourism industry. However, because of the lack of information on actual business development linked to the CCRES implementation, these benefits cannot be estimated.

5. **Project impact on sustainable use of coral reefs**. Explaining values of coral reefs to local communities and enhancing their behavior to use these reefs sustainably, the CCRES contributed to improving the marine spatial planning design and process on the local and regional level. The CCRES engaged with researchers, natural resource managers and policy makers to advancing the understanding of how dynamics within and among the components of social and ecological systems affects the value of services provided by key marine and coastal ecosystems, of how climate change vulnerabilities may be mitigated through management, and how trade-offs among management objectives may be optimized. This know-how was used to build the tools to help the process of Marine Spatial Planning (MSP) including design of the zoning plans specifically to rebuild and sustain coral reef fisheries, with the tools to help protect biodiversity in Selayar (Indonesia) and El Nido (Philippines). These benefits of the project were estimated in this economic analysis, since the tools that address provisioning value of coral reefs

are the most popular among the project beneficiaries that actually use the tools. However, since results of the tools' users surveys are inconclusive, the sustainability of the CCRES benefits is uncertain.

6. **Project impact on regional/national institutions.** Project benefits may, in fact, be even greater, as this analysis disregards benefits from new policies, monitoring tools, capacity building and new guidelines, which are all likely to have triggered — or will trigger in the future — further positive developments in terms of more sustainable coral reef management, MPAs planning and community-educated management of coastal areas.

Economic impacts of the project relates to the capacity building of government institutions at both the central and decentralized levels. Enhanced capacities of government institutions will contribute to improving public service delivery having numerous benefits and positive economic impacts. Especially with the continuing challenges of adaptation to climate change and management of coral reefs, the importance of enhanced functioning of public institutions cannot be underestimated. The better functioning of government institutions will also facilitate the implementation of future projects and investments that will build on and continue the achievements of this project. Similar considerations apply to knowledge generation and management achieved by the project.

7. **The CCRES, moreover, may contribute to poverty reduction in the project area** since it may encouraged community-led innovation in capturing and sustaining benefits from marine ecosystem services. The targeting of the most impoverished sector of the Indonesia and Philippines population, its rural villages in remote areas is likewise an achievement that has not been quantified in this analysis. The project reached rural communities in large numbers (2,974 beneficiaries, of which 1,414 were women) providing training on the sustainable use of coral reefs, business development and promoting behavioral change. These activities may empowered beneficiaries and created improved economic possibilities for these families, and thereby contribute to the elimination of poverty. The benefits of these activities are not estimated in this analysis, even though they are important.

8. Finally, all these benefits presented in Table 1are linked to the behavioral changes and willingness of the communities involved in the project implementation to use know-how generated by the project. Besides, uptake of the project tools generated low net economic return for local communities in Philippines. Since results obtained during the second and third surveys with the participants of the CCRES tools training workshops are very inconclusive in terms of indication of the project tools uptake, **economic efficiency of the project can be rated Modest**.

ANNEX 5. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS

From: Liz Izquierdo <l.izquierdo@uq.edu.au>
Sent: Wednesday, June 26, 2019 03:07
To: Kevin McCall <kmccall@worldbank.org>; Cary Anne Cadman <ccadman@worldbank.org>
Cc: Peter Mumby <p.j.mumby@uq.edu.au>; Mark Paterson <mark@curriecommunications.com.au>; Damian Hine <d.hine@business.uq.edu.au>; Carl Smith <c.smith2@uq.edu.au>
Subject: CCRES ICR – Project Executing Agency comments

[External]
Dear World Bank ICR team
In general, I agree with the ICR report prepared by Kevin McCall but provided specific comments on the text if I thought more explanation was needed. Kevin successfully interviewed CCRES project's key players (stakeholders, partners, staff and end users) and incorporated their perception on the project's objectives, performance and deliverables through its five-year life cycle.

Some learned lessons for future opportunities include:

1. Dedicate more time, at the beginning of the project, to develop a clear activity plan with concrete deliverables per year
2. Set up at feedback mechanisms (surveys) earlier on the project to improve tracking
3. Address uptake strategies at the beginning of the project by bringing together experts in translation of research and end users to discuss and develop a roll-out plan
4. Develop a risk assessment on the activity plan

Kind regards

Liz Izquierdo
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ANNEX 6: BORROWER SELF-EVALUATION

Capturing Coral Reef and Related Ecosystem Services Project

Assessment of Project Performance, Outputs, and Beneficiaries

Prepared by
Dr. Tundi Agardy
Sound Seas

May 20, 2019

Executive Summary

This report summaries the project evaluation and beneficiary assessment of the Global Environmental Facility (GEF) World Bank and the University of Queensland funded Capturing Coral Reef and Related Ecosystems Services (CCRES) project, intended to provide necessary background for the Implementation and Completion Report (ICR) required by the World Bank.

The following project assessment has relied on public and internal project documents, including World Bank public documents, CCRES outreach materials, publications by CCRES team members, and materials provided by Dr. Liz Izquierdo, Project Manager. Interviews have been conducted with the majority of team leaders, as well as the technical advisory committee members, and previously involved CCRES personnel and World Bank staff. The main thrust of the interviews was to understand perceptions about the project goals and objectives, determine the extent to which these goals and objectives have been met, and derive lessons learned from both the development of tools and processes to enhance coral reef management, and the practical application of these tools at the two case study sites. Additionally, CCRES' influence on other regions has been addressed, looking at the extent to which tools and approaches have been used in other geographical regions. Further structured discussions with intended beneficiaries will be undertaken, in concert with World Bank's organization of workshops in El Nido and Selayar, and additional meetings in Manila and Jakarta, before the comprehensive evaluation is completed.

In general, it can be concluded that the project has been largely successful, delivering in a timely manner on the goals and objectives outlined in the PDO. Tools that orient decision-makers and planners toward a better understanding of ecosystem values have undoubtedly enhanced understanding of trade-offs between development and conservation, and will enable better decision-making in the future. On a wider societal level, easy to use tools such as SISTORY have the potential to shift the mindsets of marine users. CCRES has been able to promote behavior change as well, in ways that were perhaps not anticipated during the project design phase. Proven methods for catalyzing nature-based business enterprises have spurred a lot of interest in developing new business plans. Collectively these achievements have the potential to promote development that is sustainable, thereby improving people's lives without undue negative impacts on nature.

Much can be learned from the challenges that emerged from this complex and ambitious and multifaceted project, all coordinated by University of Queensland as Project Executing Agency. First and foremost, having an academic institution manage a project of this scope, with overall goals that are less about furthering knowledge and more about development (as is the remit of the World Bank) may not have been the ideal institutional arrangement. The university performed to standards, keeping all deadlines and providing adequate oversight, but in some ways it struggled with the dual role of administering a suite of activities while also providing much of the intellectual leadership for the development and dissemination of tools. This despite the fact that the University does administer other complex social enterprise projects (see *https://uniquest.com.au/discipline/social-enterprise).*

Another challenge with this complex and multifaceted project had to do with timing. It appears the first years of the five-year project were spent in planning, with a large number of innovators promoting their

own ideas on what tools needed to be developed. In contrast, it appears that the stakeholders in the two field sites were led to believe that CCRES tools would be developed in response to the specific problems that they faced. However, the initial plan for CCRES was not the implementation of the tools; rather CCRES was originally designed to develop specific knowledge and research products for potential uptake by a number of related fisheries, coastal and marine operations in the Region, including: Partnerships in the Environmental Management of the Seas of East Asia (PEMSEA) Regional Knowledge Management Project; in Philippines: Wealth Accounting and Valuation of Ecosystem Services (WAVES) Project; in Indonesia: the Coral Reef Rehabilitation and Management – Coral Triangle Initiative (COREMAP-CTI) Project, Philippines Rural Development Project (PRDP); and in Vietnam: the Coastal Resources for Sustainable Development Project. All these projects received WB funding to implement CCRES tools.

The first year of the project was spent on identifying sites to pilot tools; thus actual design and execution of initiatives under each component was delayed until year 2. The end result appears to be that what would have been a highly ambitious timeframe for developing and then promoting the uptake of tools was compressed into a short two to two and a half years, once agreement had been reached among the wide array of players. Ten years might have been a more realistic timeframe to accomplish the overarching goal of creating new tools and approaches to measurably improve management, but then the turnover among key actors would likely have been much higher. Such turnover in project management and in team leadership, and turnover within the World Bank itself, also proved to be a challenge for CCRES.

The highly ambitious (some might say unrealistic) timeframe to develop new tools, perform outreach, conduct training, and encourage further uptake seemed in some cases to catalyze a repackaging of tools that in a few cases did not result in the innovation that CCRES hoped to achieve. Nevertheless, the last year of the project saw a flurry of new approaches and tools coming on line and being used not only in the two pilot sites but elsewhere as well.

Another challenge CCRES faced may provide a valuable lesson for other future projects of this type, and that is how to achieve integration. This integration applies to the user interface – how to promote the uptake of a suite of tools to achieve maximum effect. But it also applies to integration of learning by project participants and executants, necessary for maximizing effectiveness and efficiency. By having team leaders for individual components, CCRES may have lacked the overarching leadership to be able to learn from experiences, and make course corrections as needed. There also appeared to be a lack of clear goal and objectives to drive a coordinated and strategic set of initiatives. This project morphed several times over the course of its life – the original ambitions were replaced with an unclear array of goals, and the end result (creating a somewhat haphazard toolbox of approaches and tools) bears almost no relation to the title of the project or the originally funded proposal.

The project also seemed to suffer from the lack of a framework to make clear how tools could be used in tandem. To achieve that CCRES should have brought on board at the midterm of the project an specialist to do that task. They assumed it was the role of the Project director or the project manager which is not real as the managing of the project is a full time job.

A final challenge serves as an important lesson for projects that both promote a conceptual framework for achieving sustainability and at the same time experiment with putting that framework into practice in pilot sites. By choosing two pilot sites in different countries, CCRES had to devote time to understanding

two different sets of circumstances, and adapt their approaches and tools to the particular needs and capacities in each place. And perhaps more than the absolute number of sites, the complicating issue may have been the stage of 'development' the sites were in. Two sites might have have presented fewer challenges had they been on the same level with similar requirements, potentially providing good information about scalability.

From interviews it appears that a perception existed that different components had different levels of interest in, and thus engagement with, each project site. In part this may have to do with a perception that problem scoping was farther along in the Philippines, and that the capacity for planning and management was higher in El Nido than in Selayar, therefore less investment of time and energy were thought to be required for the Philippines pilot. The result appears to have been some friction between project partners, as well as uneven progress in meeting project objectives at the two sites.

In hindsight it may have been more reasonable to expect CCRES to experiment with tools in pilot sites to demonstrate their efficacy, as was the original plan, and then leave broader uptake to a subsequent project. Communications coming out of CCRES could then have concentrated on creating demand within the marine management community for the approaches and tools. For instance, a communications strategy might have been to identify country needs, such as resolving conflict, preventing degradation, making good on Aichi Target commitments, and striving to meet SDG goals, and then framing the communications to market CCRES tools as helping to meet those challenges. Raising awareness about value of coastal and marine systems is important, and has undoubtedly been achieved with this project. However, in regions such as these where ecosystem values are well known and where marine management is already underway, the project could have achieved even greater outcomes by emphasizing the value-added of CCRES tools and approaches in a compelling way.

ANNEX 7. SUMMARY OF CCRES MODELS DEVELOPED

CCRES TOOLS GUIDE

Available at https://ccres.net/resources/view/ccres-toolkit-guide

TOOLS DEVELOPED FOR:

I. MARINE PLANNING

1. Reef React: Reef React assists users to predict alternate futures for coral reef ecosystems under various climate and human use scenarios to help guide policy and management interventions to reduce negative impacts.
2. Coastal Protection: Coastal Protection enables users to assess the ability of coral reefs to protect shorelines from coastal erosion, and determine which reefs best protect key coastal infrastructure and communities. This information helps to guide management decisions. The tool also provides information on how wave conditions and wave forces on corals will change with sea level rise or loss of reef elevation, and how the shoreline might recede behind fringing reefs.
3. FoodWeb Model: Policy brief: Priority reefs for conservation and fisheries replenishment - The brief contains guidelines for prioritizing which reefs are best suited to marine biodiversity conservation, compared with those best used for reef fisheries.
4. MPA Toolkit: The toolbox enables coastal planners and policymakers to support decisions on the total coverage, number, placement and local size of MPAs, in order to sustain and rebuild fisheries and to protect coastal biodiversity.
   - *i.* *MPA placement optimization tool* — to optimize MPA placement for both conservation and fisheries
   - *ii.* *MPA size optimization tool* — to determine the locally optimal size of no-take MPAs
   - *iii.* *Fish SPACE* (Fisheries for Sustaining People's Access through Conservation and Equitable Systems) — a spatial planning tool that highlights the consequences of alternative decisions on total MPA coverage, placement and local size
   - *iv.* *Policy brief: Healthy fisheries through marine reserves*
   - *v.* Educational tool for marine design

II. SYSTEMS ANALYSIS

1. SESAMME: Socio-Ecological Systems App for Mental Model Elicitation (SESAMME) captures information, including past and future trends, and the current state of system components (such as resources, activities, pressures and decisions) from local communities and helps them to visualize how these components interact.
2. System Simulation Model: The System Simulation Model quantifies interactions between activities on land (such as farming and urban development), activities on water (such as fishing), coastal

ecosystems (such as coral reefs and mangroves) and coastal resources (such as fish). It allows the user to simulate the behavior of the coastal system over time.

3. SYSTORY: SYSTORY assists managers to understand and visualize the dynamics of coastal systems and assess the influence of alternative scenarios on system trajectories over time.

III. BUSINESS DEVELOPMENT

1. Ecosystem-based Business Development (EbBD) Approach for Coastal Communities: The EbBD approach uses ecosystem services and biodiversity as part of an overall sustainable development strategy to help support sustainable livelihoods and local economic development in low resource coastal communities. It steps participants through a thinking process designed to help identify enterprise-led solutions that share value along the supply chain and do not cause damage to the environment.
2. Eco-Biz Challenge: The Eco-Biz Challenge identifies local entrepreneurs and assists them in starting or expanding businesses that support the local economy, as well as ecosystem services. It expands the pool of local talent, knowledge and creativity to find and incubate eco-friendly business ideas, and boost enterprise development.

IV. BEHAVIOR CHANGE

1. My Future, My Oceans: My Future, My Oceans is a low-cost process of behavioral diagnosis and capacity enhancing. The tool empowers individuals in coastal villages to adopt behaviors that lead to healthier families, happier lives and a cleaner environment.
2. FishCollab: FishCollab assists governments, communities and NGOs to work together to improve coastal management. It enables users to identify key stakeholders, develop networks (find and develop cooperation with relevant and committed parties), analyze policy, analyze and reduce conflict, and identify opportunities and challenges using local knowledge and science.