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Report No: {PAD2072}

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED GRANT

IN THE AMOUNT OF SDR13.3 MILLION
(US$ 18 MILLION EQUIVALENT)

TO THE

REPUBLIC OF MALDIVES

FOR A

SUSTAINABLE FISHERIES RESOURCES DEVELOPMENT PROJECT
(FOURTH SOUTH WEST INDIAN OCEAN FISHERIES GOVERNANCE AND SHARED GROWTH PROJECT)

March 20, 2017

Environment & Natural Resources Global Practice
South Asia Region

CURRENCY EQUIVALENTS
February 28, 2017

Currency Unit	=	Maldivian Rufiya (MVR)
MVR 15.4	=	US$1
US$1.35389	=	SDR 1

FISCAL YEAR
January 01 – December 31

Regional Vice President:	Annette Dixon
Country Director:	Idah Z. Pswarayi-Riddihough
Senior Global Practice Director:	Karin Erika Kemper
Practice Manager:	Kseniya Lvovsky
Task Team Leader:	Tapas Paul

ABBREVIATIONS AND ACRONYMS

ABNJ	Areas Beyond National Jurisdiction
BAU	Business as Usual
BOBLME	Bay of Bengal Large Marine Ecosystem (Project)
CoA	Chart of Accounts
DA	Designated Account
EEZ	Exclusive Economic Zone
EIRR	Economic Internal Rate of Return
EO	Electronic Observer (System)
ESMP	Environmental and Social Management Plan
EU	European Union
FAO	Food and Agriculture Organization
FM	Financial Management
GEF	Global Environment Facility
GoM	Government of Maldives
ICB	International Competitive Bidding
IFC	International Finance Corporation
IOC	Indian Ocean Commission
IOTC	Indian Ocean Tuna Commission
IUU	Illegal, Unreported and Unregulated
MCS	Monitoring, Control and Surveillance
MMA	Maldives Monetary Authority
MoFT	Ministry of Finance and Treasury
MSC	Marine Stewardship Council
M&E	Monitoring and Evaluation
N	Number
NPV	Net Present Value
OP	(World Bank) Operational Policies
PDO	Project Development Objective
PMU	Project Management Unit
PRIMA	(World Bank's) Portfolio and Risk Management System
SCD	Systematic Country Diagnostic
SOP	Series of Projects
SWIO	South-West Indian Ocean
SWIOFC	South-West Indian Ocean Fisheries Commission
UNCLOS	United Nations Convention on the Law of the Sea
WBG	World Bank Group
WWF	World Wildlife Fund
AWP	Annual Work Plan (based Budget)
BAFO	Best and Final Offer
BP	(World) Bank Procedures
B/C Ratio	Benefit to Cost Ratio
CPF	Country Partnership Framework
DBOT	Design, Build, Operate and Transfer
EHS	Environment, Health and Safety
EMP	Environmental and Social Management Plan
ESIA	Environmental and Social Impact Assessment, including the ESMP
ESMF	Environmental and Social Management Framework
FCR	Feed Conversion Ratio
GDP	Gross Domestic Product
GIS	Geographic Information System
GRS	Grievance Redress Service
IDA	International Development Association
IFAD	International Fund for Agricultural Development
IUFR	Interim Unaudited Financial Report
JICA	Japan International Cooperation Agency
MEDeP	Mariculture Enterprise Development Project
MoFA	Ministry of Fisheries and Agriculture
MRC	Marine Research Centre
MRDF	Maniyafushi Mariculture Research & Development Facility
NCB	National Competitive Bidding
NTPM	National Tender and Projects Monitoring (*section*) of MoFT
PIP	Project Implementation Plan
PPSD	Project's Procurement Strategy for Development
SPD	Standard Procurement Document(s)
SIDS	Small Island Developing States
STEP	Systematic Tracking of Exchanges in Procurement
SWIOFish	South-West Indian Ocean Fisheries Governance and Shared Growth (Project)
VMS	Vessel Monitoring System
WB	World Bank
WHO	World Health Organization

MALDIVES
Sustainable Fisheries Development Project
(Fourth South West Indian Ocean Fisheries Governance and Shared Growth Project)

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PAD DATA SHEET

Maldives

Sustainable Fisheries Resources Development Project (Fourth South West Indian Ocean Fisheries Governance and Shared Growth Project) (P157801)
SOUTH ASIA
0000009274

Report No.: PAD2072

Basic Information		
Project ID P157801	EA Category B - Partial Assessment	Team Leader(s) Tapas Paul
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [X] - Small States	
	Financial Intermediaries [ ]	
	Series of Projects [X]	
Project Implementation Start Date 17-Apr-2017	Project Implementation End Date 31-Dec-2022	
Expected Effectiveness Date 10-Jun-2017	Expected Closing Date 31-Dec-2022	
Joint IFC No		

Practice Manager/Manager	Senior Global Practice Director	Country Director	Regional Vice President
Kseniya Lvovsky	Karin Erika Kemper	Idah Z. Pswarayi-Riddihough	Annette Dixon

Borrower: Government of Maldives

Responsible Agency: Ministry of Fisheries and Agriculture

Contact:	Zaha Waheed	Title:	Executive Coordinator
Telephone No.:	96-0332-2625	Email:	zaha.waheed@fishagri.gov.mv

Project Financing Data(in USD Million)

[ ]	Loan	[X]	IDA Grant	[ ]	Guarantee
[ ]	Credit	[ ]	Grant	[ ]	Other

Total Project Cost:	18.00	Total Bank Financing:	18.00
Financing Gap:	0.00		

Financing Source	Amount
BORROWER/RECIPIENT	0.00
IDA Grant	1.50
Regional IDA Grant	16.50
Total	18.00

Expected Disbursements (in USD Million)										
Fiscal Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Annual	0.80	3.07	3.13	3.64	3.22	2.74	1.40	-	-	-
Cumulative	0.80	3.87	7.00	10.64	13.86	16.60	18.00	-	-	-

Institutional Data
Practice Area (Lead)
Environment & Natural Resources
Contributing Practice Areas
Finance & Markets
Proposed Development Objective(s)
To improve management of fisheries at regional and national levels including support to establish mariculture in targeted atolls in the Maldives.

Components	
Component Name	**Cost (USD Millions)**
Augmentation of Institutional Capacity for Marine Fisheries Management	5.09
Support to Mariculture and Diversification of Fisheries	10.76
Project Management, Monitoring and Evaluation	2.15

Systematic Operations Risk- Rating Tool (SORT)	
Risk Category	**Rating**
1. Political and Governance	High
2. Macroeconomic	High
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Moderate
6. Fiduciary	Substantial
7. Environment and Social	Moderate
8. Stakeholders	Moderate
9. Other	
OVERALL	Substantial

Compliance	
Policy	
Does the project depart from the CAS in content or in other significant respects?	Yes [ ] No [X]
Does the project require any waivers of Bank policies?	Yes [ ] No [X]
Have these been approved by Bank management?	Yes [ ] No [X]

Is approval for any policy waiver sought from the Board?	Yes [ ]	No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No [ ]

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	X	
Natural Habitats OP/BP 4.04	X	
Forests OP/BP 4.36		X
Pest Management OP 4.09		X
Physical Cultural Resources OP/BP 4.11		X
Indigenous Peoples OP/BP 4.10		X
Involuntary Resettlement OP/BP 4.12		X
Safety of Dams OP/BP 4.37		X
Projects on International Waterways OP/BP 7.50		X
Projects in Disputed Areas OP/BP 7.60		X

Legal Covenants

Name	Recurrent	Due Date	Frequency
Steering Committee for the Project	X		CONTINUOUS

Description of Covenant

The Recipient shall maintain within the Ministry of Fisheries and Agriculture, throughout the implementation of the Project, a Steering Committee with composition, functions and terms of reference satisfactory to the Association.

Name	Recurrent	Due Date	Frequency
Project Management Unit	X		CONTINUOUS

Description of Covenant

The Recipient shall maintain within MoFA, throughout the implementation of the Project, a Project Management Unit staffed with competent personnel in adequate numbers, with qualifications and experience and under terms of reference acceptable to the Association, and provided with resources and powers required for effective implementation of the project.

Name	Recurrent	Due Date	Frequency
Agreements for supporting mariculture out-grower farms	X		CONTINUOUS

Description of Covenant

In providing support for the setup of each of the Mariculture Out-Grower Farms, the Recipient shall enter into written agreements with the respective beneficiary/ies, under terms and conditions satisfactory to the Association, whereby the Recipient commits to provide 'in-kind' assistance for establishing such Mariculture Out-Grower Farm(s), and the beneficiary/ies undertake to abide by the environmental and social management framework and consequent assessments and plans.

Name	Recurrent	Due Date	Frequency
Contract management	X		CONTINUOUS

Description of Covenant

The Recipient shall refrain from: (a) unilaterally canceling any contracts awarded to any contractor pursuant to the Procurement Guidelines, without prior written concurrence from the Association with

such cancellation; and, (b) awarding any contracts to any enterprise owned and/or controlled by the Recipient without prior written concurrence from the Association.

Name	Recurrent	Due Date	Frequency
Public disclosure of procurement information	X		CONTINUOUS

Description of Covenant

The Recipient shall establish and thereafter maintain throughout the implementation of the Project, a fully operational procurement documentation and record keeping system, in a manner and substance acceptable to the Association, including a freely and publicly accessible database showing the Procurement Plan and updates, the procurement notices, invitations to bid, etc., and the complaints received and the actions taken in respect thereof.

Name	Recurrent	Due Date	Frequency
Fiduciary Solutions (audit systems, qualified staff, and statutory audits)	X		CONTINUOUS

Description of Covenant

The Recipient will: (a) acquire/develop and adopt a financial management software solution with a fully integrated voucher-based computerized double entry accounting system for the project; (b) hire a firm of chartered accountants to serve as MoFA and PMU's internal auditors; (c) hire a financial management specialist, a certified public accountant and a procurement specialist as part of the staff of the PMU; (d) complete preparation of statutory audits of all project expenditure carried out covering each fiscal year of the Recipient, and furnish such Audit Reports and audited Financial Statements to the Association not later than six (6) months after the end of the fiscal year.

Name	Recurrent	Due Date	Frequency
Safeguards and Project Implementation Plan	X		CONTINUOUS

Description of Covenant

The Recipient shall ensure that: (a) the project is carried out in accordance with the provisions of the environmental and social management framework and consequent assessments and plans, and the Project Implementation Plan; (b) all necessary governmental permits and clearances for relevant project activities are obtained from the competent governmental authorities prior to commencing any activities, and any preconditions imposed in such permits or clearance are complied with; and (c) each contract for civil works under the project includes the obligation of the relevant contractor to comply with the environmental and social management framework and consequent assessments and plans applicable to the said contracted civil works.

Conditions

Source Of Fund	Name	Type

Description of Condition

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit
Tapas Paul	Team Leader (ADM Responsible)	Lead Environment Specialist		GEN06

Asif Ali	Procurement Specialist (ADM Responsible)	Senior Procurement Specialist		GGO06
Bernadeen Enoka Wijegunawardene	Financial Management Specialist	Senior Financial Management Specialist		GGO24
Mokshana Nerandika Wijeyeratne	Safeguards Specialist	Environment Specialist		GEN06
Susrutha Pradeep Goonesekera	Safeguards Specialist	Consultant		GSU06
Xavier F. P. Vincent	Team Member	Senior Fisheries Specialist		GEN07
Jan Erik Nora	Team member	Senior Operations Officer		SARVP
Chantal Andriamilamina	Team Member	Principal Investment Officer		CMGAF
Ulrich K. H. M. Schmitt	Team Member	Program Leader		SACSL
Charlotte De Fontaubert	Team Member	Senior Fisheries Specialist		GENGE
Martin M. Serrano	Team Member	Senior Counsel		LEGES
Vidya Venugopal	Team Member	Counsel		LEGES
Satish Kumar Shivakumar	Team Member	Finance Officer		WFALA
Sebnem Sahin	Team Member	Senior Environment Economist		GENGE
Darshani De Silva	Team Member	Senior Environment Specialist		GEN06
Grant Milne	Peer Reviewer	Senior Natural Resources Management Specialist		GFA12
Randall Brummett	Peer Reviewer	Senior Fisheries Specialist		GENGE
Miguel Angel Jorge	Peer Reviewer	Senior Fisheries Specialist		GENGE
Binh Thang Cao	Peer Reviewer	Senior Agricultural Specialist		GFA02
Kerima C. Thilakasena	Team Member	Program Assistant		SACSL
Niluka Nirmalie Karunaratne Sriskanthan	Team Member	Team Assistant		SACSL
Winona Rei Bolislis	Team Member	Temporary		GENDR

Extended Team

Name	Title	Office Phone	Location
Denis Gasnier	Consultant Aquaculture Expert	390657053349	Rome
Rouja Johnstone	Agribusiness Officer	390657053349	Rome
Sumeet Singh Dhir	Consultant Procurement and Financial Management	919501014123	Chandigarh
Roy D Palmer	Consultant Aquaculture Business	61419528733	Melbourne

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
Consultants (Will be disclosed in the Monthly Operational Summary)					
Consultants Required?	Consultants will be required				

I. STRATEGIC CONTEXT

A1. Regional Context

1. Maldives and 11 other countries border the waters of the South West Indian Ocean (SWIO) – the island nations of Comoros, Madagascar, Mauritius and Seychelles; and seven mainland countries: France[1], Kenya, Mozambique, Somalia, South Africa, Tanzania and Yemen. Together these countries are members of the South West Indian Ocean Fisheries Commission (SWIOFC), a regional fisheries body. The SWIO marine fisheries are part of a larger marine ecosystem shared by all countries of the region. They are a regional public asset, whose health and sustainability require regional coordination to limit the negative and enhance the positive externalities yielded by national activities, especially on the migratory fish species, such as tuna. Conservation and sustainable harvesting of the regional public goods in particular, and the shared ecosystem in general are central to the economy of the island countries in SWIO region.

2. The fisheries sector accounts for a substantial portion of Gross Domestic Product (GDP) of the SWIO countries. Seafood export from these countries was approximately US$2.7 billion in 2014. Local industrial fisheries (mainly shrimp) and tuna processing constitute a substantial part of employment, income and foreign exchange earnings. Aquaculture and recreational fishing (sport fishing and diving) are rapidly growing industries and a growing source of revenue in several of these countries.

3. Fisheries, especially small-scale and subsistence fisheries play an important role for the livelihoods of an estimated 107 million people living within 100 kilometers of the coast in the SWIO countries. They are often among the most vulnerable communities with high exposure to climate change impacts. The fisheries sector is a major contributor to nutritional health and food security in the SWIO region, especially for poor coastal communities with limited alternatives to fish for animal protein, as well as essential nutrients, vitamins, minerals and trace elements.

A2. Country Context

4. Maldives, comprising of 26 atolls of 1,192 small coral islands of which 188 are inhabited by a local population of 338 thousand, has successfully built on its extraordinary natural assets to promote growth and socio-economic development. This was achieved mainly by developing a successful high-end tourism sector, whose sizeable rents have been redistributed to the population to address its development challenges. GDP per capita increased from US$268 in 1980 to US$7,681 in 2014 (highest in South Asia), mainly driven by tourism and non-tradable tourism related activities. Incidence of poverty in Maldives is in line with that of an upper middle-income country, and its human development index is second only to Sri Lanka among the countries in South Asia. The share of the population living on less than US$1.25 a day was 4.9 percent in 2010, whereas the corresponding share using the US$2 a day poverty line was 17.02 percent in 2010.

5. Despite this outstanding performance, the pace of poverty reduction has been below potential; and the level of inequality remains a major challenge. Limited job opportunities and skill-endowments, especially for women and youth might have played an important role in limiting contribution of growth to poverty reduction. In particular, lack of growth in fisheries is an important cause of the limited impact of growth on poverty reduction, especially in the atolls away from Malé.

6. The World Bank's Systematic Country Diagnostic, 2015 (SCD) provides a snapshot of the inherent vulnerabilities of Maldives' development program including immediate concerns about the fiscal, environmental and social sustainability. Due to its macro-economic vulnerability, given the small size, it is important to look for economic diversification away from tourism and heavy reliance on imports; and to promote an inclusive development of the labor market with particular opportunities for women and youth.

[1] The French overseas territories, including La Réunion and several other islands, are located in the SWIO region and surrounded by Exclusive Economic Zones totaling 2,652,013km^2.

There is a need to augment climate-proofing of the economy as climate change could cause annual economic losses of more than 12 percent of GDP by 2100. Emphasis on environment and natural resources management, especially preventing damage and pollution of the coral reefs is important to sustain and increase climate resilience of tourism and fisheries, the crucial components of the national economy.

B. Sectoral and Institutional Context

7. **Regional Level:** An estimated 28 percent of the SWIO regional fish stocks are over-exploited or depleted (especially the high-value resources, such as shrimp, lobster, and sea cucumber). A further 40 percent of stock are fully exploited (SWIOFC, 2011) from overfishing by industrial vessels and artisanal fishers, apart from widespread use of destructive equipment and techniques (such as dynamite or beach seines). Critical ecosystems, already weakened by land-based pollution are further endangered by loss of biodiversity, and destruction of coral reefs and mangroves. Consequently the coastal resource base is acutely threatened. As a result, it was estimated that SWIO coastal states incurred annual losses of US$225 million in 2008. Furthermore, a weak investment and business climate, coupled with limited or underperforming infrastructure and services, significantly constrain industrial and artisanal private sector development.

8. As small-scale fisheries modernize, the limited potential of many coastal fisheries will require that fishing effort be reduced to become sustainable. This will generally translate into fewer vessels or jobs in harvesting operations, and require that attention be devoted to alternative livelihood opportunities in post-harvest value addition, aquaculture, and recreational fisheries or in other sectors. Reduction or elimination of destructive fishing is also a significant governance and social challenge.

9. The fisheries sector in the SWIO is already largely regional, with each country's decision affecting activities of other countries. In particular, large national investments, such as ports, fishing fleets, or processing plants, are competing against each other. Regional coordination is therefore needed to avoid conflicts and suboptimal sectoral investments, and to promote equitable distribution of wealth. Furthermore, several technical aspects of the sector are regional in nature (e.g., monitoring, control and surveillance, and safety at sea), and their implementation, at the least, has to be coordinated at a regional level.

10. The countries also face common constraints with regard to their fisheries sector: weak governance, weak human and institutional capacity, and a fragile business environment. The SWIO countries will therefore benefit from addressing these challenges jointly. They already use regional platforms to share their experience in implementing more sustainable and economically viable fisheries policies and practices, including the Indian Ocean Tuna Commission (IOTC) and SWIOFC. Greater regional cohesion will enhance the countries' voice in international fora as well as in negotiating fishing-related agreements, where decisions made have significant impacts on the fisheries sector of the SWIO countries.

11. The SWIO countries have repeatedly called for attention to regional collaboration in the sector, recognizing the important contribution by the marine fisheries to regional and national goals: including poverty reduction, food security, economic growth, balance of payments, and the value of natural capital. In response, major donors (the European Union, EU; France; the Global Environment Facility, GEF; and the World Wide Fund for Nature, WWF) and the World Bank have all supported regional fisheries programs in the recent past.

12. Consolidating and expanding past projects and analytical advice, the World Bank committed in-principle to finance the multiple South West Indian Ocean Fisheries Governance and Shared Growth (SWIOFish) series of projects (SOP) in 2015. Three consecutive series of projects are expected: SWIOFish Phase 1 during 2015-21 (*hereafter referred to as the SWIOFish SOP*); SWIOFish Phase 2 during 2022-27; and SWIOFish Phase 3 during 2028-32. Under the first series, the First South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish1) was approved in 2015 (covering Comoros, Mozambique, Tanzania and the Indian Ocean Commission). The second project covering Madagascar and

the Indian Ocean Tuna Commission) and the third project covering Seychelles are expected to be approved in 2017. Maldives is the fourth planned project in the SWIOFish, to be followed by similar country-level projects in Somalia, Mauritius and Kenya (all expected to be approved in FY18). (See Figure 1.)

Figure 1: Phasing of SWIOFish SOP

Series of Projects: Phases →		**SWIOFish Phase 1**							**SWIOFish Phase 2**						**SWIOFish Phase 3**				
Central Themes →		Regional Collaboration & Foundation of Fisheries Management							Enhanced Regional Collaboration & Fisheries Governance						Value Chain Development & Integration				
Projects	**Beneficiaries**	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2032	[…]
SWIOFish1	IOC / SWIOFC																		
	Comoros																		
	Mozambique																		
	Tanzania																		
SWIOFish2 (P1533701)	IOC / IOTC																		
	AIODIS-FPAOI																		
	Madagascar																		
SWIOFish3	Seychelles (P155642)																		
SWIOFish4	**Maldives** (P157801)																		
Potential SWIOFish Projects	Somalia																		
	Mauritius																		
	Kenya																		

13. SWIOFish SOP Theory of Change: Approved as part of the first project of the Phase 1 SOP, the theory of change states that: (i) the regional approach aims to support the fisheries sector in the concerned countries to achieve better governance as a pathway to the overarching SOP development objectives; (ii) any project within the SWIOFish SOP would require a change management phase, and support during the period of transition towards effective fisheries management by providing incentives for new behaviors; (iii) such support at country levels to enable change management and transition will include reforms in the fisheries sector management supported by financial transfers, assistance to alternative livelihoods, activities and business management, financial education, and a communication campaign directly tailored to the implementation of the fisheries management plans (in target areas). Eleven SWIOFC member countries, including Maldives, signed in March, 2014 the Zanzibar Declaration, which conveyed full commitment to the principles articulated in SWIOFish with the aim of supporting regional integration around fisheries management.

14. All SWIO countries, with the exception of Maldives, have ongoing or recent World Bank engagements in fisheries through analytical works, International Development Association (IDA) funded investment projects (in addition to the first SWIOFish project), the International Finance Corporation (IFC) investment in aquaculture, grant projects, and the former regional-GEF funded South West Indian Ocean Fisheries Project. The proposed regional-IDA financed project in Maldives will fill a crucial gap in the World Bank Group engagements for the Small Island Developing States (SIDS), in addition to fulfilling the objectives of SWIOFish SOP.

15. **National Level:** The fisheries sector is a critical contributor to the national economy and an important economic activity in all of Maldives' inhabited islands. In 2015, primary fisheries accounted directly for 1.4 percent of GDP {excluding manufacturing (3.5 percent of GDP); wholesale and retail trade (4.7 percent) and transport (8.7 percent) where fisheries has a major role} and 11 percent of employment. The sector generated US$140 million in export revenue in 2015 (and a high of US$161 million 2013), which is almost all of Maldives' physical exports. Although the relative importance of the fisheries sector has

declined since the late 1970s (due to the rapid growth of tourism), its role in the economy remains significant, including in providing food and nutrition security and as a source of livelihood and employment in remote islands without a major tourism facility. In the atolls away from Malé, 30 percent of the household heads work in fisheries.

16. Although the country benefits from vast fishing resources spread over 923,000 square kilometer of exclusive economic zone (EEZ), the total fish catch had declined from 185,923 tons in 2005 to 127,350 tons by 2015; and direct employment reduced from around 14,000 in 2001 to less than 9,000 persons now. The bulk of fisheries catch (up to 95 percent) are skipjack and yellowfin tuna. The Maldivian tuna is considered a premium product due to high quality fish stocks, pristine water, and sustainable fishing methods. Reef fishes, which account for 5 (average) to 16 percent (in low "tuna years") of catch are mainly used for domestic consumption and supply to resorts, but export is rising (especially for grouper, sea-cucumber and aquarium fish). The tuna fishery, especially the skipjack 'pole and line' fishery has been recognized as one of the most environmentally responsible fishery operations in the world (certified by the Marine Stewardship Council, MSC), a dimension that has helped maintain the higher than usual export prices in the recent past.

17. Sustainable and diversified development of the fisheries sector is part of the Government of Maldives' vision, which encourages economic growth based on a diversified economy and aims at increased job opportunities. The Ministry of Fisheries and Agriculture (MoFA), with support from the Japan International Cooperation Agency (JICA), is preparing a Fisheries Sector Roadmap to: (a) update and implement fisheries management plans including diversification; (b) strengthen the country's monitoring, control and surveillance systems; (c) establish a better knowledge of the impacts of climate change on the fisheries sector; (d) reduce the excessive use of live bait in tuna fishery; and (e) address the heavy exploitation of export-oriented reef fishery.

18. The business-as-usual (BAU) scenario suggests that the fishery sector is threatened, and the income and jobs from the sector is at risk (see Annex 2 for details). The challenges of the fisheries sector are threefold. First, given the dependence of so many island people on fisheries, sustenance of capture fishery at about 120,000 tons and maintaining an export of about 60 percent of the catch are important for the national income and welfare of fishers and their families. Measures, such as compliance with the IOTC resolutions on improved surveillance and monitoring, or improved monitoring and generation of evidence to justify continuation of MSC certification, will be important to sustain exports and premium export prices. Operationalization of the Government of Maldives' decision to focus on all value-added processing of tuna, and a quality control limit for tuna fishing are also required. Other challenges include inefficient use of infrastructure, inadequate distribution, and lack of access to finance to invest in fisheries value chains.

19. Second, there is a need to ensure sustainability of live-bait and reef fishing. The high value tuna fisheries sector is dependent on live-baits and reef ecosystem. Excessive reef fishing as well as capture of live-baits (for tuna fisheries) are considered threats to coral reefs. Anecdotal evidence suggests that capture of groupers is already unsustainable. Diversification and consequent (partial) shift away from capture fishery is important on three accounts: (a) to minimize impacts on coral reefs, and to sustain the reef fish population, especially groupers; (b) ensure sustenance of the capture fishery to protect jobs and income of most of the households who are currently engaged in fisheries and associated vocations; and create alternatives for households who will not be able to continue in capture fishery; and, (c) to create dependable income and growth opportunities for communities and individuals who have gradually been excluded from the mainstay tuna fishing and related local processing operations, and who are involved in opportunistic reef fishing.

20. The opportunities for diversification are, however, limited. Mariculture appears to be the only substantial opportunity, for benefiting the communities, reducing the excessive pressure from reef or bait fishing, and providing meaningful employment opportunities for individuals, including women and youth currently outside the gainfully employed workforce. Some initial mariculture works which have been experimented with so far include pearl oysters, Maldivian clownfish, and brown marbled groupers. A

private aquaculture farm is producing sea cucumbers, producing the larvae in hatcheries before growing them in lagoons. The future development of mariculture, however, is hindered by limited availability of fingerlings/juveniles, feed, financing and appropriate technology.

21. Third, inclusive development of fisheries sector is important for substantive job creation. Towards this, mariculture, diversified capture of relatively deep-sea species and aquarium fishery appear to be ideal for Maldives. These have the potential to grow and contribute to the reduction of unemployment among inhabitants of remote atolls. In implementing such a program, however, special attention needs to be given to the establishment of a gender sensitive policy and regulatory framework, the establishment of benefit sharing mechanisms for the natural resources to be managed and, capacity building of atoll councils and small businesses.

22. While Maldives' fisheries sector represents an undeniable engine of inclusive growth for the country, its sustainability and future will depend on three important and interrelated factors: (a) better and more transparent governance over fishing through all aspects of the value chain including post-harvest processing; (b) ensuring that greater value is captured across the value chain and that wealth generation opportunities are shared with marine resources dependent communities, especially youth and women; and (c) improved livelihoods and meaningful income opportunities for communities in the remote atolls, who should squarely be at the center of future sustainable mariculture development efforts.

23. Fisheries in Maldives is intricately connected with the wellbeing of the regional fishery stock. In spite of using sustainable fishing practices, the capture of tuna has come down from 184,000 tons to 127,000 tons – arguably due to the diminishing stock in the Indian Ocean as a whole. Maldives has been focusing on yellowfin tuna in the recent years. In spite of practicing sustainable fishing in the Maldivian waters, the yellowfin tuna population in the Indian Ocean Region has shrunk, and the IOTC has now specified reduced quota for yellowfin catch. It is evident that these regional level issues have had implications at the national level. The tuna stock in the Indian Ocean is somewhat at risk, and it is expected that tuna catch will reduce further in the coming years.

24. The best option for Maldives is to work with other countries to ensure sustainable practices over all of the Indian Ocean Region. At the same time, Maldives needs to (a) augment its own systems, procedures, compliance mechanisms, and skills to retain the "environmentally sustainable" branding to capture premium price at international markets, and (b) share the knowledge of its own systems, procedures, compliance mechanisms, and the "environmentally sustainable" fishing technology with the other countries. By demonstrating higher capture of value and premium price, Maldives can demonstrate to the other countries that conservation indeed pays.

25. Nevertheless, Maldives will need to grow, and this need threatens other parts of the ecosystem even if tuna fishing is at the current sustainable level. Maldives cannot afford to espouse the cause of conservation of tuna fishery (in its own waters and in the region) and at the same time destroy/diminish reef fishery. Therefore, diversification into mariculture and consequent (partial) shift away from capture fishery (in particular for new entrants) is important on two counts: (a) to minimize impacts on coral reefs, and to sustain the reef fish population, especially groupers; (b) to create dependable income and growth opportunities for communities and future generations, especially women who had been gradually excluded from the mainstay tuna fishing and related local processing operations, and youth who are involved in opportunistic reef fishing. The agenda of conservation of reef and waters, reef fishery, and development of mariculture as the best diversification option, therefore are closely linked to the regional conservation agenda. For a detailed description of the way each of the components, sub-components, and activities in the project are linked to the SWIO regional agenda, see Annex 2 including Table A2.2.

26. As discussed above, a Regional IDA investment in Maldives is a crucial part of the SWIOFish SOP. SWIOFish1 and SWIOFish2 mention specific investment in Maldives. Maldives is currently co-chairing (and will take over as chair in 2017) the SWIOFC, and is participating in the SWIOFish Bureau meetings, the Scientific Committee Meetings, meetings of the Working Group on Fisheries Data and Statistics, meetings

of the Working Party on Cooperation and Coordination in Tuna Fisheries, and the overall SWIOFC meetings including annual SWIOFC Sessions – all supported by SWIOFish1. Maldives also benefits from SWIOFish1 regional support to develop a National Observer Program, in line with the IOTC's recommendations, to eventually be able to participate in the SWIOFC Countries' Regional Observers Program. Under SWIOFish2, Maldives will benefit from training by IOTC Secretariat's technical teams to better implement Maldives' international fisheries obligations under the IOTC, such as the Port States' Measures to combat Illegal, Unreported and Unregulated fishing.

27. In essence, an investment in sustainable fisheries resources development in Maldives will be beneficial to the countries in South-West Indian Ocean region, due to (i) economies of scale from shared infrastructure, technologies, and knowledge; (ii) positive externalities yielded by national activities to avoid the "tragedy of the commons" scenario; (iii) addressing common constraints jointly through regional platforms and workshops; (iv) greater regional cohesion in the international fora as well as in negotiations of fishing-related agreements where decisions need to be collective and impacts are shared; and, (v) upgraded value-chain linkages by collectively helping their fisheries sector integrate into more competitive value chain. See Annex 2, paragraphs 51-56 for details.

C. The Series of Projects Approach

28. The proposed project is part of the regional SWIOFish SOP (see Figure 1), that aims to incrementally consolidate the emerging regional vision and collaborative framework, founded on the common objective of economic growth and poverty reduction based on the sustainable use of SWIO marine resources (that can only be achieved over the longer term). The SWIOFish will serve as a long-term financing platform to help SWIO countries address the shared challenges and development issues through an expanded multi-borrower approach. It is expected to (i) help establish a financing, coordinating and knowledge exchange mechanism, and (ii) support a suite of regional and country-level activities over the medium and long term. Given the range of issues affecting countries of the SWIO region, the SOP activities target core governance and productivity challenges, the removal of critical constraints to private investment and sustainable business, bringing part of the 'offshore fisheries economy' within country economies, and adding value through regional collaboration and integration. A central thrust of the SOP is that while the challenges are regional in nature, addressing them requires action at the national level, which will yield regional benefits, enhance ownership and efficiency, and strengthen national institutions to enhance the overall health of fisheries in the region.

29. The overarching SOP Development Objective is to increase the economic, social, and environmental benefits to SWIO countries from sustainable marine fisheries. The SOP Development Objective-level Results Indicators are as follows:

(a) Reduce the degradation of the status of fish stocks;
(b) Increase in the fisheries-related GDP in participating countries; and
(c) Increase in local fisheries-related value-added activities benefitting the households.

30. Within the SWIOFish SOP, Maldives is already part of the regional components of the first two projects through: (a) the active role within the SWIOFC and in the IOTC; (b) the regional actions of the Indian Ocean Commission (IOC) financed by SWIOFish1, and of the IOTC and the Indian Ocean Artisanal Fishers Federation in SWIOFish2. The SWIOFish1 is supporting national and regional level activities as defined by the theory of change. Regional activities – which benefit all SWIO countries - includes strengthening of SWIOFC and the IOC to facilitate collaboration on a wide range of issues between member countries, particularly in terms of improving the conditions for access to tuna fisheries, support to improve regional Monitoring, Control, and Surveillance (MCS) activities. The SWIOFish2 will extend support to further strengthen the IOTC to enhance collaboration on regional fishery resources, in addition to country and local level activities. In SWIOFish3 (Seychelles) and SWIOFish4 (Maldives, i.e., the current project), the activities implemented nationally will support achieving the SWIOFish1 and SWIOFish2 objectives.

31. The World Bank has not committed to finance any activities beyond the current project. However, all SWIOFC member countries are eligible to participate, contingent on available funding in SWIOFish SOP in the future phases. Therefore, it is likely that Maldives, like all other SWIO countries, will be able to access additional investments in future, including within the current SWIOFish SOP, if availability of national and regional IDA resources permit either an additional financing or a follow-on project, contingent on the performance of implementing the current project.

32. A potential future repeater project in Maldives (under either SWIOFish SOP or its future phases) would further strengthen the policy reforms and empower stakeholders and users to have a greater role and incentives to secure the long-term health of the resources. It would support major investments prepared and shown to be viable in Phase 1, including in infrastructure, in co-financing of mariculture development, sector infrastructure and fleet adjustment and fisheries reform. It would deepen regional management efforts including collaboration with a focus on ensuring sustainability of that collaboration. Finally, it would further harness benefits along domestic and international value chains.

D. Higher Level Objectives to which the Project Contributes

33. Sustenance, development and growth in the fisheries sector in Maldives is closely linked to the Indian Ocean regional agenda on conservation, shared vision for management, and compliance to regional/international standards. There are substantial potential benefits to Maldives from economies of scale offered by shared regional information infrastructure, technologies, and knowledge related to monitoring, control, and surveillance; safety at sea; and towards adaptation to impacts of climate change on the fisheries sector. In return, Maldives has the potential to offer several benefits to other countries of the Indian Ocean Region, especially the small island countries. In the interconnected ecological region, every country could benefit by enhancing the positive externalities yielded by other countries' national activities. The migratory species in the SWIO region, such as tuna, are archetypes of this shared regional public good and their sustainable harvesting requires coordination to avoid the "tragedy of the commons" scenario. Therefore, at the regional level, the higher level goal of the project is the same as the SWIOFish1 objective, i.e., to improve the management of selected priority fisheries at regional, national and community levels.

34. At the national level, the overall purposes of the project would be to enhance the government's capacity to manage (and govern) the fisheries sector, including formulating appropriate adaptive sector policies; to ensure sustainability of marine fisheries; and to develop mariculture as an important source of inclusive growth of economy, income and jobs, so as to respond to changing needs of the Indian Ocean Region.

35. The project is consistent with and conforms to **World Bank Group's Country Partnership Framework for Maldives** (FY16-19). Marine fisheries is highlighted in the Bank's Systematic Country Diagnostic, 2015 (SCD) as a sector that is making critical contributions to Maldives' national economy and forms the most important primary economic activity in many of the country's inhabited islands. SCD suggests that: (a) there is substantial potential to harness fisheries for growth, employment generation, value-addition, and export development, and at the same time, (b) the fisheries sector is facing multiple challenges concerning sector governance, management, enabling business environment, technology development, and investment attraction that require close attention and provide entry points for Bank support. Based on the SCD findings and the discussions between the Bank and the Government in September 2015, this project was included in the World Bank Group's new Country Partnership Framework (CPF) for Maldives 2016-2020. The project is fully aligned with the World Bank's **South Asia Regional Integration Strategy** (2014) that identifies improved management of shared natural resources as a high priority area to support regional integration.

II. PROJECT DEVELOPMENT OBJECTIVES

A. Project Development Objective

36. The Project Development Objective (PDO) is to improve management of fisheries at regional and national levels including support to establish mariculture in targeted atolls in the Maldives.

B. Project Beneficiaries

37. At the regional level, national institutions, experts, and fisheries industry in the Indian Ocean Region will benefit from: (a) improved capacity to formulate and analyze policy and common agenda; and (b) technology transfer and knowledge sharing from project activities. Private sector stakeholders in the SWIO Region, including enterprises engaged in large-scale fishing, or aquaculture, or providing services to the sector, fishing fleets, investors in fisheries and mariculture and the tuna processing enterprises, and foreign investors in the tourist resorts (in Maldives) are important regional players and will benefit indirectly from the project. Consumers of the exported fish and fish products, some of whom are from the SWIO Region, will also be indirectly benefitted.

38. At the national and local levels, the main project beneficiaries will be the households where fishing is a vital component of livelihoods, small-scale commercial fishers and dry fish processors. Activities to augment, sustain and conserve the marine fishery will benefit all 9,500 fisher households currently employed in the fishing sector (vessel owners, fishing crew, and workers in the value chain of tuna fishing) by reversing the trend of declining and threatened fishery resources. The main beneficiaries of new mariculture and improved conservation regime of reef fishery will be communities living in the remote atolls of Maldives, including about 1,800 persons who will receive direct benefits. MoFA and its affiliated agencies such as the MRC will directly benefit from the improvement of capacities for fisheries sector management.

39. There will be induced benefits for people across Maldives who are associated with fishing, such as in supply of fishing gears, cages, or fish feed; traders, aggregators and exporters; experts, researchers, and other youth who take up jobs in marketing, logistics chains related to mariculture and value chain improvements in the country. The project will also indirectly benefit producer and professional organizations, industry or fisher associations and an expanding set of local atoll level individuals who are part of the export chain for reef fisheries.

C. PDO Level Results Indicators

40. The project seeks to achieve the following key results (see Annex 1 for details):

(a) SWIO countries comply with IOTC resolutions for management of Tuna Fishery (Regional-level Indicator; same as SWIOFish2 indicator);
(b) Vessels complying with IOTC requirements on monitoring and reporting (Regional-level Indicator);
(c) Value of production from mariculture supported by the project;
(d) Direct project beneficiaries (of which share of female beneficiaries); and,
(e) Share of target beneficiaries with rating ‘satisfied’ or above on project interventions.

III. PROJECT DESCRIPTION

A. Project Components

41. The proposed project is the fourth in the SWIOFish SOP. As articulated in the SOP description, a central thrust of the SOP is that while the challenges are regional in nature, addressing them requires action at the national level, which will yield regional benefits, enhance ownership and efficiency, and strengthen national institutions to help enhance the overall health of fisheries in the region. The SOP implementation

follows a principle of subsidiarity, whereby only activities that are transnational are to be managed at the regional level through a regional body. For example, Component 1: Enhanced Regional Collaboration under SWIOFish1 and SWIOFish2 (Maldives is a beneficiary country under this component in both projects), is administered through the IOC. Maldives is again a beneficiary country under another component managed by the IOTC in SWIOFish2. All activities under the proposed SWIOFish4 (Maldives) Project will be implemented at the national level, to avoid duplication of activities managed by regional entities in SWIOFish1 and SWIOFish2.

42. The project components are directly linked to the wellbeing of the regional fishery stock. Other than 'Project Management, Monitoring and Evaluation', the project will consist of two components – one will focus on improving the currently inadequately managed capture fishery, and the other will support diversifying the fisheries economy so that sufficient jobs and incomes are created outside capture fishery to reduce stress on the regionally shared fish stock. Both components will build improved resilience in Maldives. A detailed project description is provided in Annex 2.

43. **Component A: Augmentation of Institutional Capacity for Marine Fisheries Management** (US$5.09 million). This component seeks to enhance the Government's capacity to implement a more effective monitoring of the fisheries sector and internal control system of key marine fisheries value chains, and will focus on delivery of the Indian Ocean Regional agenda (as well as the intended adaptation agenda) of improving the overall fisheries management, marine zoning for long-term benefits, and a longer-term plan to establish and operationalize in-country skill and capacity building activities, essential for sustenance and growth of the fishery sector in Maldives.

44. The four sub-components include: (A1) development of key fisheries management and planning instruments including updating the fisheries policy and legislative framework, zoning the entire Maldivian EEZ, and supporting grouper fish management, coral reef and reef fishery management plans which are essential for regional conservation and improved compliance with IOTC recommended conservation and management measures; (A2) development and implementation of fisheries management activities to ensure compliance with IOTC and EU requirements, including expanded MCS, vessel registration and monitoring systems, electronic observer systems and augmentation of related reporting systems for commercial marine fisheries; collaboration with the SWIO Sub-Regional Fisheries Monitoring Centers; and, support and facilitation to regional agencies and international actors on the common agenda of conservation and management measures; (A3) support to long-term program for fisheries management including sampling programs for tuna and recreational fish species, stock assessments and conservation zone surveys which will contribute to regional assessments and subsequent actions; the preparation of protocols for disease surveillance; and quality control of brood stocks and fish feed; (A4) fisheries sector capacity building including short and medium-term training, development of curriculum and teaching aids, collaboration with National Geographic Information System (GIS), and development and operation of a fisheries management information system – all focusing on strengthening local and national skills that will contribute to the national and SWIO Region agenda related to fishery management and consequent diversification into mariculture.

45. **Component B: Support to Mariculture and Diversification of Fisheries** (US$10.76 million). Potential economic growth from diversification of capture fishery and from mariculture are pre-requisites for sustenance of the capture fishery resources in the Maldivian EEZ. However, mariculture is nascent in Maldives; to be able to develop this sector, research, demonstration and provision of extension services will play key roles in addition to the three primary inputs: seeds, feed and access to finance. The minimum requirement therefore is a combination of the following essential elements: (a) research, demonstration and extension to support diversification and growth; (b) a publicly financed "design, build, operate and transfer" (DBOT) contract for multispecies hatchery, without which mariculture cannot start; (c) a sufficient number of household level mariculture out-grower farms, to be able to demonstrate technical and commercial viability, and attractive income across atolls, without which mariculture of a viable scale capable of absorbing fluctuations in the export market cannot be established; and (d) initial support for

backward linkages such as supply of imported fish feed, and forward linkages such as connecting to collectors and exporters of mariculture products.

46. The four sub-components include: (B1) development and demonstration of mariculture production and technology package including completion and operationalization of the infrastructure, and preparation of medium-term operations plans and service standards for the *Maniyafushi* research and development facility (MRDF) as a center of excellence for the entire SWIO region; development and demonstration of technology packages for mariculture species; and market studies in support of mariculture choices; (B2) promotion of mariculture out-grower schemes and seafood growth clusters including assessments of carrying capacity and of supporting community custodianship of the coral reef resources, start-up investments including training, advisory support and compliance monitoring in out-grower farms, technical support to small enterprises for establishing out-grower contractual arrangements between small producers and larger private sector aggregators, and studies to help develop gender actions in mariculture; (B3) supporting design, construction and operation of a multispecies hatchery including breeder stock development programs and professional training plans; and, (B4) scoping of long-term marine fisheries diversification studies including planning and scoping of studies related to technology packages and conservation plans for new marine species to be explored in future.

47. **Component C: Project Management, Monitoring and Evaluation** (US$2.15 million). This component would provide equipment, technical assistance, training, and incremental operating cost to strengthen the overall administrative capacity and capability of the Ministry of Fisheries and Agriculture and its Project Management Unit (PMU) to manage, implement, and monitor and evaluate project activities. Specifically, support will include staffing and operation of the PMU; establishment of adequate financial management and procurement management systems; implementation of the communication plan and grievance redress activities; monitoring and evaluation (M&E) and third party audits; preparation and implementation of specific environmental impact assessments as per the national laws; coordination with other ministries such as the Ministry of Environment and Energy and the private sector; special evaluation studies; and sharing of monitoring protocols, evaluation studies and specific experience of implementation of various aspects of fisheries management that are of interest to SWIO Region countries.

B. Project Financing

48. The project will be financed by an International Development Association (IDA) Grant, including "regional IDA" resources. As the fourth project in the SWIOFish SOP, the project meets the criteria for accessing regional IDA: (a) the SOP currently directly involves six countries; (b) it supports policy harmonization for ecological connectivity and regional integration in the Indian Ocean Region; (c) it has spillover benefits, and avoids negative spillover impact at the regional level beyond the country boundaries; and (iv) the project, through continued support to the SWIOFC, provides a platform for a high-level of policy harmonization between countries and is part of a well-developed and broadly supported regional strategy. All components and sub-components of the project have strong linkage to the SWIOFish agenda.

C. Project Cost and Financing

49. The total project cost is estimated at US$18 million. This will be financed by IDA grants including "regional IDA" resources in the amounts of US$16.5 million and IDA national resources of US$1.5 million. Table 1 below summarizes the project cost and financing by components and sub-components.

Table 1: Project Costs and Financing by Component (US$ million)

Project Components	Project cost	IDA Grants		% Financing
		National IDA	Regional IDA	
1. Augmentation of Institutional Capacity for Marine Fisheries Management	5.09	-	5.09	100%
2. Support to Mariculture and Diversification of Fisheries	10.76	-	10.76	100%
3. Project Management, Monitoring & Evaluation	2.15	1.50	0.65	100%
Total Project Costs	**18.00**	**1.50**	**16.50**	**100%**

D. Lessons Learned and Reflected in the Project Design

50. Lessons from the Bank's extensive experiences in the implementation of regional projects, especially from the Africa and South Asia regions, include: (a) given the complex nature of regional projects, national projects or components should be prepared separately when ready, but as key building blocks to an integrated regional program. Other countries in SWIO region already have Bank/IFC financed operations, and the current project in Maldives will help close the last gap in country-level financing from SWIOFish; (b) knowledge products, technical assistance, and capacity development are key complementary activities that help support regional dialogue, preparation and implementation readiness. This project is designed to be part of the integrated SWIO regional program, with a strong emphasis on knowledge, skill and capacity development; and, (c) it is best to choose activities in a 'regional project' that are well-embedded in national development plans, as the initial implementation in SWIOFish1 project shows. This would help manage the significant political risks in regional projects arising from conflicting perspectives that are inherent in inter-country relationships and simultaneously address aspirations of national stakeholders.

51. From a sector perspective, the project draws on lessons learned from several projects[2], including: (a) building foundations of sustainable institutions, enabling business environment and human capacity is as important, if not more, as undertaking major reforms and investments. This project, therefore, provides significant support to develop human resources and skill upgrading; apart from ensuring that the institutions, especially the research institutions become sustainable; (b) operations in reform of the fisheries sector require an extended time horizon, a high degree of flexibility, and continuous support for progressive capacity-building. To address these, the project activities are grouped into mainly two components providing flexibility, and the support for capacity building targets with extended time horizon, not merely delivery of the project outputs; and nesting the current project within an overall SWIOFish SOP approach; (c) given the nature of the fisheries sector in Maldives, which addresses established capture fishery and the associated vested institutional structures, and a nascent mariculture sector that does not have clear institutional architecture, a phased SOP approach is recommended for improved management; (d) formally establishing and staffing a well-functioning monitoring and evaluation system is fundamental; and therefore, even if the project could have been implemented by the MoFA itself within the activities of its regular divisions, a project management unit is set up to provide the required monitoring and evaluation system; and (e) experience from the SWIOFIsh1 project and other fisheries management projects suggest that facilitating and enabling a business environment that provides opportunities for alternative but relevant livelihood for people currently engaged in fisheries sector is essential for mobilizing these

[2] These include the SWIOFIsh1 Project, Development Policy Loans in Peru and Gabon; the West Africa Regional Fisheries Project, the Lake Victoria Environmental Management Project, Tanzania's Marine and Coastal Ecosystem Management Project, the Kenya Coastal Development Project, and the Coastal Resources Management Project in East Asia.

important stakeholders and obtaining their engagement on the sustainability agenda and the required processes of social change and reform. This project therefore, puts equal emphasis on fisheries sector management (Component A) and the needed diversification (Component B).

52. With respect to the technical and operational challenges of promoting a nascent mariculture sector, lessons were drawn from the aquaculture projects and programs (including those financed by the Bank). These included: (a) aquaculture is successful when it is managed and invested by private sector, and the public sector role is that of a facilitator and of quality assurance. This project, therefore, provides start-up support to mariculture with options open for eventual higher level of private sector investment. The project will part-finance only such a small volume of out-grower farms so as to establish commercial attractiveness of mariculture, but not to an extent where future private investment is prevented or crowded out. Essential value-chain investments, such as manufacture of fish feed, are left open for the private sector; (b) the private sector is not likely to invest in a nascent mariculture sector unless the risks are mitigated for the upfront investments. Important upfront investments, such as the multispecies hatchery will therefore, be completed in a design-build-operate-transfer model, with financing and revenue risks cared for by MoFA; (c) even at the small farm level, aquaculture is essentially a commercial activity, and community-based aquaculture farms have not shown commercial success due to lack of clear linkage between individual pursuits and income. The project, therefore, will promote households (and not community groups, even if the households from the entire community are selected) as the promoters and owners of out-grower farms.

53. Project design addresses lessons from related sector investments and assessments in Maldives. Investments in the fisheries sector have been rare in the recent decade, except for the International Fund for Agricultural Development (IFAD)-financed Mariculture Enterprise Development Project (MEDeP). There are however, significant capacity building support and technical assistance by the JICA (who is currently preparing the Fisheries Sector Roadmap) and the Food and Agriculture Organization (FAO) (who had been involved regularly in technical assessments and advisories for improving governance and institutional arrangements for the capture fishery), as well as technical assessments by the Bank. Based on experiences of the IFAD-financed project, this project will invest upfront in the multispecies hatchery; and will explore in future taking advantage of the Bank of Maldives' loan facilities for out-grower farms. Given the experience of the MEDeP, organizational design of the PMU avoids conflicts and competition with the regular divisions of MoFA and draws on the regular jurisdictions of the relevant divisions of MoFA as far as possible. The project will also take advantage of the upcoming recommendations of the JICA-financed master plan; and will finance activities that have been recommended by FAO technical support, such as improving the statistical capabilities, expansion of the MCS, installation of new age vessel monitoring and emergency response systems (VMS), and overall revision of the national fisheries policy.

54. Projects in Maldives, in general, experience significant implementation delays. These will be addressed by (a) creating the PMU to accelerate decision-making process within the implementing agency; (b) lack of clarity in roles and jurisdiction of specially created PMUs. In this project, the respective roles of PMU vis-à-vis MoFA and its divisions are clearly identified; and MoFA divisions will remain responsible for delivery of the results, with PMU as an enabling mechanism; (c) low capacity of the contracting and supply industry. This is specifically addressed by the procurement strategy, and the best-suited procurement methods will be used, such as limited international bidding. Complex procurement decision-making at multiple levels is also avoided by concentrating procurement activities at the PMU, where adequate capacity will be created; only the high-value contracts will need approval from the Tender Board (set up by the MoFT).

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

55. MoFA has the mandate, jurisdiction and experience in managing fisheries, and will lead project implementation. The MoFA has implemented or participated in implementation of Bank-financed projects

several years ago, not in the recent past. While MoFA has a large mandate, it has limited staff. A dedicated Project Management Unit (PMU) has therefore been established within MoFA, with adequate number of technical staff, including expert staff on mariculture development, extension, research, and market studies; environmental and social management; financial management, procurement, communication, monitoring and evaluation.

56. The responsibilities of MoFA including the Steering Committee include providing national policy and implementation framework; approval of the project and securing the required budget from the Ministry of Finance and Treasury (MoFT); approval of the project's overall annual action plans and annual budgets; and overall implementation oversight. MoFA will ensure that most of the project activities are duly executed by its regular divisions and field offices. MoFA has also prepared a Project Implementation Plan (PIP), which describes the project activities and their estimated costs, allocation of implementation responsibilities, procurement and financial management arrangements and plans, screening and eligibility criteria for mariculture out-grower farms and respective beneficiaries to guide implementation.

57. The PMU mimics the organizational structure of the MoFA. This is important because: (a) the actual execution of project activities will take place using the MoFA divisions and their field offices, and a clear coordination between the PMU and the relevant MoFA division is needed, as PMU staff will be deputed in those divisions and field offices; (b) an appropriate part of the additional expertise and staff recruited under the PMU are expected to be absorbed in the respective MoFA divisions at closure of the project for long-term improvement of institutional capacity; (c) even if most of the staff will be recruited from market (including expatriate consultants given the shortage of qualified fisheries experts in Maldives), the organizational structure of the PMU will allow MoFA to depute permanent staff of regular divisions to the PMU in a manner that staff can make career progressions and based on performance can return to their parent divisions when the deputation is over. The detailed description of PMU organizational design is at Annex 3.

58. The PMU will be responsible for project implementation, facilitating statutory clearances including environmental permits; procurement of works, goods and services; and implementation of specific capacity building activities as per the PIP. PMU staff working on procurement, financial management, knowledge management, monitoring and evaluation will be located in Malé while all other operational cells including fisheries management, fisheries compliance, marine research, and mariculture will be co-located with the MoFA divisions at Malé or at the field (including at the offices of Island Councils) and/or the offices of MRC, MRDF, or the site of the multispecies hatchery. The PMU, through its marine research, fisheries management, and compliance cells, will support MoFA for its retained role in coordinating with IOC, IOTC, SWIO Region countries. The main PMU cell will provide research and logistics support to MoFA in its forthcoming role of chairing the SWIOFC.

59. The PMU will collaborate with and seek support and partnerships with a range of other agencies to strengthen the capacity of the main implementing actors. These will include international knowledge centers, including the World Aquaculture Alliance; academic and research institutes including the Maldives National University; private sector business houses and industries including the Maldives National Chamber of Commerce and Industry; civil society groups and atoll level community organizations; and, other government departments responsible for development and protection of marine resources (such as the Ministry of Environment and Energy).

B. Results Monitoring and Evaluation

60. The statistical systems on fisheries in Maldives are fragmented, do not cover aspects such as reef fisheries or recreational fishery, and are of varying quality. This is largely due to weak human capacity and lack of investment in maintaining the dedicated data collection systems, software and human resources required. Baselines for this project have been established using the best available, though incomplete set of desirable information. These include information generated by FAO and World Bank studies, studies undertaken as part of the JICA-financed Fisheries Sector Roadmap, and the MEDeP. One of the important

project activities will be strengthening the statistical information system (in collaboration with the National Statistical Bureau). As the statistical information system is strengthened, the benefit of adding additional modules so that the system itself could provide regular monitoring information is self-evident.

61. Monitoring and evaluation of outcomes and results are a core part of the project design. The PMU and the MoFA Divisions will collect and present data and reports for six-monthly reviews by the MoFA Steering Committee in conjunction with World Bank implementation support missions, so that corrective actions are identified in time as may be required. Discussions during these missions on issues such as institutional capacity building, financial viability, technical reviews and site visits will also provide effective means of monitoring progress. In addition, the Steering Committee will continuously monitor performance of the PMU itself, so that protracted delays due to lack of proactivity of the PMU can be avoided.

62. Each cell of the PMU will be responsible for monitoring and reporting, based on detailed formats and guidance from PMU, and as per the PIP. These will be consolidated by the Monitoring and Evaluation Specialist at the PMU, who will cross-reference these reports against the project's outcome indicators. All monitoring data will be shared with the MoFA Policy & Coordination Division, and will be available to the National Statistical Bureau, and all interested stakeholders (such as the other countries of SWIO region).

63. The project will undertake two independent evaluations, through selected independent expert consultants: one prior to the mid-term review of the project, and another six months prior to closing of the project. These evaluations will be augmented by annual opinion surveys of beneficiaries of the project.

C. Sustainability

64. The core elements of the SOP and of the current project are designed to ensure sustainability. The work on governance of the capture fishery sector is complemented by exploration and development of new capture fishery technology modules, which will ensure that even if the current fishing practices become subject to restrictions (to be able to manage the marine resources from a regional sustainability and conservation perspective), the potentially perceived losses are compensated by encouraging investment in technology packages that are demonstrated to be viable. For the anticipated SOP investments in mariculture, the scale of activities are such that they are well within the demands from East Asian markets; and in the current project sufficient to create successful demonstration. The project will support substantial knowledge and capacity building, and skill upgrading, which, on the one hand will help sustain gains from the project, but on the other will need future financial resources to continue generating knowledge, addition of capacity and skill. Given that future financial resources are not guaranteed, the project activities that have major potentials for commercial returns are designed in such ways that they will contribute financial resources to the MRC and the MRDF in perpetuity. Such contribution from a part of net commercial return to the out-grower farms supported by the project will be about US$600,000 in Year 5 of the project, and will grow to about US$1 million in Year 6, and will be equal or more than the average annual investment needed in sustaining knowledge and capacity building, and skill upgrading activities for the next 5 years.

65. The project will underwrite public sector financial sustainability by improving the effectiveness of the public institutions and by facilitating increased private sector investment in the value-chain. Public finances will benefit from more cost-effective production, from public fiscal receipts from new and more profitable enterprises entering the economy, and by timely repayment of public investments supporting private sector (i.e., household enterprise level) productivity.

66. The issue of sustainability of institutional arrangements is being taken care of by organizational design of the PMU (the only institutional structure created by the project) that resembles the MoFA regular divisions. Appropriate staff of the PMU including the skills established during the project is expected to merge into the regular divisions of MoFA once the project is over.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

67. Overall, the risk rating is 'Substantial".

Table 2: Summary of Key Risks

Risk Category	Rating
Political and governance	High
Macroeconomic	High
Sector strategies and policies	Substantial
Technical design of project	Moderate
Institutional capacity for implementation and sustainability	Moderate
Fiduciary	Substantial
Environment and Social	Moderate
Stakeholders	Moderate
Overall	**Substantial**

68. Political, governance and macroeconomic risks are high as highlighted in the SCD, 2015. Maldives is highly vulnerable to macroeconomic shocks due to its small size, lack of economic diversification outside tourism and heavy reliance on imports. In recent years, the development model has led to an increasing share of revenue dependent on tourism, while an increasing share of expenditure has become rigid. The transition to a democratic system is still in progress; powers and relationships among democratic institutions remain to be settled. A growing gap between aspirations and opportunities for socio-economic inclusion has contributed to fostering disenfranchisement among Maldivians, especially the youth. Increasing distortions on the labor market add to the stakeholders risks. This project itself partly mitigates a bit of these larger risks (by de-concentration of growth away from tourism and construction, potentially generating additional export and revenue earning from mariculture, and providing new skilled jobs to the labor market), but in effect, such larger risks will remain outside the purview of the project to influence adequately.

69. Risks related to sector strategy and policies were partly mitigated by undertaking appropriate dialogue with multiple stakeholders including private sector agencies involved in the value chain for mariculture during preparation of the project. But such risks would remain "substantial" as the current project is not addressing all value-chain issues. In light of experience from other Bank financed projects, as well as the experience of the MEDeP, where lack of clarity about internal controls, lack of timely and appropriate audits, absence of forward financial planning, delay in procurement and contract awards had been major factors affecting implementation, the fiduciary risks remain "substantial". These risks will be managed by (i) use of appropriate procurement strategy, and the adequate procurement and financial management manuals, (ii) training and capacity building of the PMU, Marine Research Center (MRC), and the relevant divisions of MoFA on all applicable fiduciary aspects; and (iii) wider training on the principles of public procurement and financial management.

70. Technical risks arise from (i) lack of in-country expertise on mariculture; scientific, commercial and technological uncertainties; and (ii) the Bank's limited experience in fisheries sector in Maldives for about 15 years now. The risk was partly mitigated by the engagement of international experts who have expertise in similar operations, and by learning from similar operations in other regions. Given that development of currently nascent mariculture is the mainstay among the project activities, the entire project may suffer if mariculture models were found to be difficult to implement. Adequate assessment of market, price and demand for mariculture products; and economic sensitivity analyses covering short and medium-term risks have generated a fair basis to estimate commercial/economic costs and benefits as well as future

prospects. Incorporation of these analyses has mitigated some of the risks, but the residual risks will still be important, and are considered “moderate”.

71. Risks related to climate change and disaster are mainstreamed in the design of the project. The major physical investments such as MRDF and multispecies hatchery will be built above maximum probable tide levels, and designed to withstand high wind, storm surge and rising sea levels. Hatchery tanks containing brackish water and rearing lagoons will have no impact even if seawater gets in. Similarly, mariculture out-grower farms are immune to rise in sea levels and temperature. In addition, the project will bring in some additional resilience to the fisheries sector as a whole, by: (a) promoting improved management of capture fishery to reduce stress on fish stock possibly impacted by rise in sea surface temperature; (b) augmenting vessel monitoring systems that doubles-up as an alert, warning and rescue tool with respect to extreme weather and climate events; and (c) promoting mariculture as an alternative, which is substantially more resilient compared to capture fisheries.

72. Risks related to institutional capacity for implementation, owing to the insufficiency in staffing, lack of specialized skill among the staff of the implementing agencies, and an overall gap in appropriately skilled personnel in the country were addressed in the design of the project (including organizational design of the PMU, staffing of the MRC and MRDF), and the residual risk is considered “moderate”. Consultations with multiple sets of stakeholders formed the basis of design of the project, and as such there is a high degree of endorsement among the stakeholders on the specific outputs that the project will deliver. However, as the felt needs are much higher than what could be delivered within the confines of one project (e.g., not all eligible islands or households can be provided with support to start mariculture out-grower farms) it would be prudent to accept that residual stakeholders risks are “moderate” instead of “low”.

73. The project does not include any resettlement from land, livelihood or access to livelihood. The project design was developed through consultations with multiple stakeholders, and the ultimate out-grower farms in the remote atolls will be established through a participatory process. Residual (important but not substantial) risks will be about the ability of the target household based out-grower farms to negotiate on equal footing with private sector agencies and intermediaries involved in the export of fish and other elements of the value chain. For this, a number of micro-level capacity building activities will be implemented, and the proposed augmentation of extension services will play a significant risk-mitigating role. As the project aims to (i) augment the current certified sustainable fishing practices; (ii) further reduce pressure on the coral reefs; and (iii) reduce pressure/threat to endemic species, it will add environmental benefits. Further, specific avoidance and mitigation measures are mainstreamed in the project design, and included in the project’s environmental and social management framework (ESMF) to address risks from (i) inappropriate site selection for mariculture interventions; (ii) low but non-trivial pollution of lagoons from mariculture; (iii) escape and spread of disease from cultured species; and, (iv) culture of exotic species, and consequent gene pool contamination. The residual environmental risks are “moderate”.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

74. Benefits of the project refer mainly to the increase in income for the fishermen by (a) avoiding loss of income from capture fishery in the BAU scenario; (b) adoption of new technologies both in capture fishery and mariculture; (b) improved access to traditional and new export markets; (c) better value chain management; (d) adoption of quality standards for new products; and (e) favorable business environment. Fisheries and mariculture activities are expected to become more beneficial also through favorable conditions regarding fish catch and market prices, such as the new opportunities created by the Free Trade Agreement between Maldives and China. Under the assumption that the fish stocks are depleting; project activities including conservation activities for capture and reef fishery will slow down the potential decline of fisheries-related GDP, and eventually increase it. Diversification through mariculture will add new jobs, income and higher domestic fisheries-related value-addition benefits for households. Potential increase

fiscal revenues from license or penalties, however, are not counted as project benefits, since they appear in the macro-economic benefits as "transfers".

75. Full realization of the expected project benefits will require: (a) immediate reforms regarding fisheries management; (b) a strong political commitment to the reform process including aspects regarding fees and penalties for non-compliance; (c) adequate attention to reef management activities by Ministry of Environment and Energy; and (d) full complementarity with other international financing institutions' investment. As these are issues that cannot be absolutely guaranteed, the economic analysis takes a conservative view: assuming that only about 60-70 percent of the planned benefits will eventually materialize, conservative estimates of income/revenue from mariculture; whereas the cost estimates are more robust, and in the case of mariculture out-grower farms, the hidden costs are also added.

76. Benefit-cost analysis is developed by comparing the increase in value creation for the fishermen with respect to the BAU scenario (which is also the baseline scenario), as follows: (a) for capture fisheries, enhanced monitoring and surveillance in yellowfin and skipjack tuna is expected to increase exports by around 5 to 40 percent compared to BAU, but would not be able to, within the project period, pull back prices that would be down by 10 percent due to uncertainties about the sustenance of stock. An additional loss of 20 percent in Maldivian exports in the BAU scenario is expected to be avoided by setting up VMS and electronic observation systems to comply with the IOTC requirements. The BAU scenario includes that the free trade agreement with China would help to compensate these effects by 10 percent, but reduction of catch by 1 percent per annum, reduction of prices and exports down by 5 percent, and overall domestic price reduction by 1 percent per annum as per the BAU will not be arrested with the project interventions; (b) with regard to mariculture and reef fisheries, improved conservation in reef fisheries and increased value addition from mariculture would complement a growing BAU which includes out-grower farms of sea cucumber (by the MEDeP). Mariculture activities are expected to increase by 2.5 percent annually. Overall, despite an expected fall in tuna and grouper catch, increase in annual revenue creation by the project is expected to reach US$88 million in 10 years. The project investment is justified since the benefit-cost ratio is estimated around 15 (Table 3), and the economic internal rate of return (EIRR) is more than 200 percent.

Table 3: Overall Economic Benefits of the Project

Economic Benefit Parameters	Current Project	With Phase 2 Project
NPV of Costs (20 years) including project cost	US$ 26,340,000	US$ 34,220,000
NPV of Benefits (20 years)–conservative estimate	US$ 486,060,000	US$ 525,480,000
Benefit/Cost Ratio (B/C Ratio)	14.02	15.36
Economic Internal Rate of Return (EIRR)	209%	211%
NPV of Net Benefits (20 years)	US$ 337,820,000	US$ 369,370,000
Sensitivity Scenario 1: Discount Rate of 14% (maximum probable commercial interest rate)	B/C Ratio: 11.68	B/C Ratio: 12.82
Sensitivity Scenario 2A & 2B: Benefits down by 20%, delayed by 2 years, costs up by 10%	B/C Ratio: 7.49 EIRR: 59%	B/C Ratio: 8.27 EIRR: 61%
Sensitivity Scenario 3A & 3B: Benefits down by 50%, delayed by 3 years, costs up by 20%	B/C Ratio: 3.64 EIRR: 33%	B/C Ratio: 4.03 EIRR: 35%

77. Subsequent phases of SOP will further increase marine capture benefits by $10 million and Mariculture and Reef benefits by $70 million. Real interest rate in Maldives reported at about 10 percent is used in the calculation of net present values (NPV). Sensitivity analysis shows that even if only 50 percent of benefits accrue with a delay of 3 years, and costs are increased by 20%, the project will still be viable.

78. In addition to the direct gains, other benefits can also be estimated financially, but are not included in the conservative estimate of benefits of the project. These would refer to a multiplier effect through: (a) increment in export duties and tax revenues; (b) enhanced food security for the remote island

communities; (c) increase in manufacturing and services related to the fisheries industry (fish feed, vessel building, installation and repair of mariculture cages, etc.); and (d) job creation in fisheries related sectors.

79. Project Sustainability and Fiscal Impacts: The liability of the project to the government arises from immediate expenditure on associated infrastructure (jetty, staff accommodation, mosque, etc., financed under a different project by the MoFA, with approved FY17 budget) that will be needed for the multispecies hatchery and on long-term financing needs to operate and maintain the infrastructure and systems created by the project. In the long term, MoFA will bear incremental costs for government staff associated with the institutional reforms, PMU staff expected to be absorbed in MoFA; continuing research, quality assurance, disease surveillance activities for mariculture; and continuing and regular upgrading of the augmented MCS, VMS, and electronic observation systems. These recurrent expenditures are estimated to be about US$1.37 million per year on the average for the first 5 years after closure of the project. A conservative estimate of contribution from mariculture out-grower farms supported by the project (see Paragraph 64, above) alone will be able to cover the recurrent costs for about 5 years after closure of the project. Growing requirements for research, development and extension services will potentially increase the overall expenditure to US$2.73 and US$5.47 million per year at 10 and 15 years after the project, contingent on further growth of mariculture beyond this project.

80. **Rationale for public investment.** The activities proposed under the project are typically government- financed. Institutional reforms in the fisheries sector, strengthening of the enabling environment for private sector development (such as for future diversification including in mariculture), and fostering coordination on regional issues can only happen through government action.

81. **Bank value-added.** The World Bank has been at the forefront in supporting the management and development of the SWIO fisheries sector in the past decade, mainly through the successful implementation of Bank-managed, GEF-financed South West Indian Ocean Fisheries Project (SWIOFP), implementation of SWIOFish1 project, and preparation of the SWIOFish SOP and SWIOFish3 project. The World Bank's convening power will also be a critical asset to the project to foster cooperation across sectors, boundaries and donors, and especially in integrating country-level enhancements at and through the IOC and IOTC. In addition, the World Bank's experience in developing and implementing similar operations in Comoros, Mozambique, Tanzania, Seychelles and Madagascar and at the regional level as well as in West Africa and the Pacific will bring significant value-added to the achievements of this project.

B. Technical

82. The project supports activities in three broad sets. The first set of activities such as establishment of zoning in the EEZ, establishment of potential fishing zones, out-grower farms for groupers, multispecies hatchery, quality control and disease surveillance facilities will be done for the first time in Maldives. For these, the challenge has been to reach a consensus on the methodology and tools for implementation. During preparation, expert consultations were undertaken with a wide range of relevant public and private sector agencies to determine the appropriate methodologies to be followed. Capacities of relevant agencies to undertake these activities were assessed and confirmed during preparation. It is likely that most of the requisite skills do not exist in the country, and therefore, the design of the activities includes dedicated resources or methods to source international skills.

83. A second set of activities containing implementation of MCS and VMS, preparation of grouper management plan, reef and coral conservation plans, research and culture of various species of fish and other resources suitable for mariculture are challenging despite relevant experience in Maldives in implementing similar activities. During preparation, adequate attention was paid to uncertainties in these activities. Activities were designed based on requisite assessments and include not only measures to adapt to uncertainties, but also redundancies so that in the event of an acceptable degree of failure, the activities will still be able to achieve the objectives.

84. The third set concerns regular activities similar to what had been implemented successfully in Maldives in the recent past. These include investments in pen-culture or out-grower for sea cucumber, community-based preparation and implementation of coral reef conservation plans, mobilization of communities, especially women in livelihood improvement support activities. Ensuring that these investments will be implemented and operated adequately is not a constraint. However, availability of adequate numbers of suitable professionals (such as for implementing extension services) is a challenge. The project, therefore, includes substantial training and skill enhancement activities that will create the requisite additional number of professions.

85. Overall, the technical design and readiness of each project components are satisfactory, and conforms to national and/or international standards.

C. Financial Management

86. Proposed Financial Management (FM) arrangements, described in detail in the Financial Management Manual (which is a part of the PIP) are adequate and meet the requirements set out in OP10.00. A PMU with adequate dedicated staff including FM staff will be established under MoFA. PMU on behalf of the MoFA will be handling Bank funded operation and would be responsible for the overall financial management arrangements of the project. Payments from the Designated Account (DA) will be authorized by MoFT. There will be no funds transferred to any other agency. The accounting and payments process will be centralized at the PMU and at the MoFT. The Finance Manager in the PMU will have oversight responsibility for implementing financial management arrangements. The proposed financial management arrangements are adequate and have been confirmed during appraisal. There are no overdue audit reports or ineligible expenditures under the MoFA. The PMU has also developed a Financial Management Manual that describes the detailed requirements for the project, including the financial management arrangements.

87. The PMU would coordinate with the MoFT to open a dedicated DA in US dollars with the Maldives Monetary Authority (MMA) to receive funds from the Bank. Disbursements will be report-based. An initial advance will be deposited into the dedicated DA maintained in US dollars. Thereafter, withdrawals from the DA will be made on the basis of six monthly forecasts as reflected in the quarterly Interim Unaudited Financial Reports (IUFRs) for the project. IUFR for the project will be prepared by the PMU. Quarterly IUFRs are due to be submitted by the PMU to the Bank within 45 days following the end of each quarter. The project will undergo regular internal audits and internal audit reports will be submitted to the project's internal audit committee, and shared with the Bank. Financial statements of the project will be prepared by the PMU and audited annually by the Auditor General's Office of Maldives. These audited financial statements together with the auditor's report will be submitted to the Bank within six months of the end of each fiscal year. For details, refer Annex 3.

D. Procurement

88. Procurement risks are assessed as "substantial". The main procurement risks are: (a) inadequate overall procurement capacities; (b) inadequate capacity of national contractors or suppliers that may hinder designing appropriate qualification requirements as per Bank's Standard Bidding Documents for goods and works contracts; (c) inadequate experience in contract administration; (d) poor implementation regarding public disclosure of procurement actions; and (e) weaknesses in transparency and fairness of procurement processes. The procurement risk management measures include: (a) the PMU will hire a full-time procurement specialist having experience in the World Bank procurement procedures to provide training to existing procurement staff, specifically on fraud and corruption flags, and on addressing complaints; (b) the PMU will prepare and share with the Bank an annual procurement progress report, which will include, inter alia, procurement plan updates, action on findings of post reviews and description of other procurement and contract administration issues; (c) the PMU will monitor contracts spanning implementation, defects liability and warranty phases; (d) the PMU will establish and operationalize a procurement documentation and record keeping system within 6 months of effectiveness of the project;

and (e) corrective actions to be taken to address deficiencies identified in post reviews undertaken by the Bank. These arrangements have been described in detail in the Procurement Strategy and Manual (which are part of the PIP).

89. The PMU will be responsible for overall procurement, except that procurement of high-value contracts (i.e., contracts with estimated value of US$166,000) will be managed by the MoFT and the National Tender Board. A Procurement Manager in the PMU will manage all the procurement under the project assisted by a Procurement Specialist, who will have experience in procurement in projects financed by international agencies, and additional procurement staff. In addition, the Division Chiefs and other relevant officers of MoFA will receive procurement training facilitated by the World Bank. This training will include modules to improve the skills on procurement and contract administration. The MoFA has prepared a Procurement Plan for activities in the project. The Procurement Plan will be updated in agreement with the World Bank annually or as required to reflect the actual project implementation needs. For details, see Annex 3.

E. Social (including Safeguards)

90. The project is expected to generate positive social impacts. The project has a potential for creating meaningful jobs for households in remote atoll communities, and will aim to address knowledge gaps with regard to participation of women and youth in mariculture. No involuntary resettlement or physical displacement is envisaged due to project interventions. The project design ensures that there will be no economic or livelihood displacement impacts, including restriction of access, during installation of mariculture, out-grower farms and construction of the facilities such as multispecies hatchery, or the quarantine and quality assurance laboratories, or from marine zoning plans. All the natural resources management plans including the fisheries management plans and the marine zoning plans will be prepared using transparent and consultative processes that will ensure that future restriction of access to natural resources will be managed in agreement with the stakeholders. The ESMF outlines detailed guidelines of measures for environmental and social risk mitigation and institutional arrangements for conducting environmental and social assessment, instruction for preparation of Environmental and Social Assessments (ESIAs), which include Environmental and Social Management Plans (ESMPs), and their implementation and monitoring. For details, see Annex 3.

91. Citizen engagement: The project will provide access for the primary stakeholders i.e., the people currently employed in the capture fishery to the VMS, which will work as an information system as well as an emergency alert system. The combination of VMS and the (web-based) fisheries information management system will provide important information services such as weather condition, risks, information about fish aggregating devices, and in future about the potential fishing zones to the citizens. The PMU will provide extension services to households engaged in out-grower mariculture farms; and will run communication campaigns aimed to maximize citizens' participation in the project. A separate beneficiary satisfaction survey will be carried out within a year of start of the project, at midterm, and at the completion of implementation, for feedback from beneficiaries with particular consideration of youth and women. The survey will provide information for further planning and corrective actions, if required. Additionally, the project will (a) continue to host public consultations regularly during implementation, to receive feedback and use these for improving implementation, (b) provide access to citizens to comment on, complain against and discuss issues during project implementation on the MoFA webpage for the project, and (c) publicize the World Bank's grievance redress service (see section H below). The project will also support a helpline service to receive complaints for timely tracking, monitoring and redressal of grievances.

92. Gender mainstreaming: The project will try to maximize participation of women and youth in the remote atolls in mariculture. Selection criteria for households to support out-grower mariculture farms will include: (a) willingness to accept female ownership and technical management of the enterprise; and, (b) the consideration that existing or planned livelihood options do not impede household engagement of women. It is expected that at least 20 percent of the direct beneficiaries of the project will be women.

Additionally, to address knowledge gaps related to constraints and opportunities of women and youth in the overall fisheries sector and mariculture, the project will undertake: (a) a gendered analysis of fisheries value-chain to identify specific entry points for women and youth; (b) a behavioral diagnostic to promote youth participation in fisheries sector; and, (c) communication and sensitization specifically aimed at women and youth. These studies will help preparation of action plans to promote participation of women and youth in economic opportunities created in the project.

F. Environment (including Safeguards)

93. Environmental Assessment (OP/BP 4.01): The project is categorized as an Environmental Category B. The environmental impacts of the project will mostly be beneficial, as the project aims to conserve the marine resources, avoid and stop unsustainable capture and yields, comply with the best regional and international standards, and diversify into mariculture as an alternative to capture of threatened reef fishes. These are parts of the priority agenda of adapting to climate change induced impacts in Maldives. MoFA has prepared the ESMF to ensure all negative impacts associated with project investments are avoided and/or mitigated, and appropriate environmental management measures are implemented. The ESMF prescribes the scale of due diligence (such as ESIAs including ESMPs, environmental guidelines for mariculture sub projects, operational management guidelines, etc.) and monitoring required for all activities under the project. To meet the national regulatory requirements, specific ESIAs (and subsequent permits from the Ministry of Environment and Energy) will be needed for the (i) multispecies hatchery; (ii) augmentation of the infrastructure of the MRDF; and (iii) out-grower farms for mariculture, when the sites are selected for these activities. The ESMF provides budgets to prepare such ESIAs. All activities in the project will obtain government permits and clearances as may be required, and comply with all pre-conditions stated in such permits and clearances. Each contract will specify and bind the contractors to implement the ESMP(s) as relevant. An ESIA has already been prepared for the aquatic animal quarantine facility, and is annexed to the ESMF. The ESMF has been disclosed in country and in the World Bank's InfoShop on January 17, 2017. For details, see Annex 3.

94. The Natural Habitats Policy (OP/BP 4.04) is triggered because all of the country's islands are surrounded by coral reefs and sensitive marine ecosystems which are significant natural habitats. The ESMF has in place due diligence measures to avoid or reduce the impacts to the coral reefs, marine ecosystems and associated fauna and flora during the establishment and subsequent operation of mariculture out-grower farms (in the remote atolls, selected specifically to avoid impacts on corals and water quality). To meet requirements of the international treaties and agreements, the ESMF confirms that Maldives is a signatory to the United Nations Convention on the Law of the Sea (UNCLOS), and the applicable fisheries sector policy and legislation conform to the provisions of the Article 73 of the Convention.

G. Other Safeguards Policies Triggered

95. No other safeguard policies are triggered for the Project.

H. World Bank Grievance Redress

96. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

Annex 1: Results Framework and Monitoring

MALDIVES: Sustainable Fisheries Resources Development Project
(Fourth South West Indian Ocean Fisheries Governance and Shared Growth Project)

Results Framework

Project Development Objectives

To improve management of fisheries at regional and national levels including support to establish mariculture in targeted atolls in the Maldives

These results are at	Project Level

Project Development Objective Indicators

Indicator Name	Core	Unit	Base line	Cumulative Target Values					Frequency	Data Sources and Methodology	Responsibility for Data Collection	Description/ Comments
				YR1	YR2	YR3	YR4	YR5				
SWIO countries comply with IOTC resolutions for management of Tuna Fishery	-	%	72.0	-	-	-	-	77.0	Annual	IOTC assessment using Compliance Reports (baseline: 2015)	MOFA (Compliance Division) using Formal IOTC Compliance Reports	Cumulative targets. IOTC undertakes a periodic (or annual) assessment of compliance of the countries to the updated IOTC resolutions for management of tuna fishery.
(Sub-Indicator) Compliance by Maldives to the IOTC regulations	-	%	78.0	-	-	-	-	83.0	Annual	IOTC assessment using Compliance Reports (baseline: 2015)	MOFA (Compliance Division) using Formal IOTC Compliance Reports	Same as above.
Vessels complying with IOTC requirements on monitoring and reporting.	-	%	0	0	0	25%	50%	90%	Annual	Annual analysis of cases of non-compliance using real-time monitoring data	MOFA (Compliance Division)	Cumulative targets. Current fleet size is 1,100. Estimated that fleet size will remain at similar level.

Indicator Name	Core	Unit	Base line	Cumulative Target Values					Frequency	Data Sources and Methodology	Responsibility for Data Collection	Description/ Comments
				YR1	YR2	YR3	YR4	YR5				
Value of production from mariculture supported by the project	-	US$ million	0	0	0.5	3.0	6.0	9.0	Quarterly	Production data from mariculture farms and price average of monthly mean market price data compiled.	PMU	Cumulative targets. Price data will be based on the regular market surveys (Hong Kong, SAR, Chinaand Singapore).
Direct project beneficiaries (of which share of female beneficiaries)	Y	N (%)	0 (-)	50 (10)	100 (10)	400 (15)	900 (15)	1800 (20)	Quarterly	Quarterly Progress reports	PMU	Cumulative targets. Direct beneficiaries of the project are principally: (1) households who receive support from the project to start mariculture out-growers; (2) persons employed in activities and enterprises supported by the project; (3) the professionals who receive enhanced skill training from the project; (4) community members who receive capacity building through substantial training, or through direct exposure to the project activities; and (5) persons employed in value chains created by the activities supported by the project. Each household, where supported, will be assumed to be constituted by 5.9 persons.
Share of target beneficiaries with rating 'satisfied' or above on project interventions	Y	%	-	-	-	60	-	80	Annual	Perception survey in Year 1, and during MTR and ICRR	PMU	Cumulative targets. Data will be disaggregated by gender and age group cohorts. The perception survey in Year 1 (even if all beneficiaries are not identified) will establish baseline.

Intermediate Results Indicators

Indicator Name	Core	Unit	Base line	Cumulative Target Values					Frequency	Data Sources and Methodology	Responsibility for Data Collection	Description/ Comments
				YR1	YR2	YR3	YR4	YR5				
Provision of support to the Island Countries to improve their negotiation capacity within IOTC	-	Yes/ No	N	-	Yes	Yes	Yes	Yes	Annual	Reports before and after IOTC annual meetings	MRC/PMU	Annual targets. Supporting the capacity will include convening, organizing and facilitating joint negotiation stance (described in a joint draft) prior to each IOTC annual meeting.
IOTC Compliance Support Mission completed in Maldives (cumulative)	-	N	0	1	2	3	4	5	Annual	IOTC Compliance Support Mission Reports	MoFA Compliance Division	Cumulative targets.
Key policy or legal instruments updated in Maldives	-	N	0	-	1	1	2	2	Six-Monthly	Progress Reports	PMU/MoFA	Annual targets. These may include: (i) Fisheries Policy; (ii) Revision of relevant policies to meet UNCLOS requirements: (iii) marine zoning; and (iv) any relevant management plans.
Vessels inspected under MCS	-	N	0	0	100	500	1100	1100	Six-Monthly	Progress Reports	PMU	Cumulative targets. Vessels in the entire fleet are expected to be inspected.
Fishing trips covered with Electronic observation	-	N	0	0	2000	3000	5000	6000	Six-Monthly	Progress Reports	PMU	Annual targets. As per IOTC recommendations 5% of all fishing trips (total trips are 100,000 per year).
Viability demonstrated for out-grower farms	-	N	100	100	125	150	200	250	Six-Monthly	Progress Reports	PMU	Cumulative targets. Number of out-grower farms (at household level) that become viable (when annual

Indicator Name	Core	Unit	Base line	Cumulative Target Values					Frequency	Data Sources and Methodology	Responsibility for Data Collection	Description/ Comments
				YR1	YR2	YR3	YR4	YR5				
of sea cucumber (or other species equivalent in value)												operating cost is not more than 70 percent of the value of annual production). The baseline of 100 is the number of out-grower of sea cucumber that is supported by the MEDeP project (which should be developed by end-2017).
Viability demonstrated for out-grower farms of groupers (or other species equivalent in value)	-	N	0	0	0	20	100	200	Six-Monthly	Progress Reports	PMU	Cumulative targets. Number of out-grower farms (at household level) that become viable (when annual operating cost is not more than 70 percent of the value of annual production).
Production of fingerlings by the hatchery	-	N	0	0	0	100,000	1,000,000	2,000,000	Six-Monthly	Progress Reports	PMU	Annual targets.
Out-grower mariculture farms receiving extension services.	-	%	0	0	10%	30%	60%	90%	Six-Monthly	Progress Reports	PMU	The project is creating the entire extension services for mariculture (not in place currently).

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Annex 2: Detailed Project Description

MALDIVES: Sustainable Fisheries Resources Development Project
(Fourth South West Indian Ocean Fisheries Governance and Shared Growth Project)

A. Context

1. As an island country and archipelago, Maldives is classified as a Small Island Developing State (SIDS). It also forms one of the twelve countries that share the waters of the South West Indian Ocean (SWIO) and is a member of the regional fisheries body called the SWIOFC[3].

2. The fishery sector is a key sector in Maldives' economy and forms the most important economic activity in almost all of its inhabited islands. The abundance of coastal and marine natural resources in Maldives forms the basis of the country's two most important economic activities – fisheries and tourism. Even if the relative importance of the fisheries sector has declined since the late 1970s (due mainly to the rapid growth of tourism), its role in the Maldivian economy remains significant. Fisheries play a critical role in food supply, job generation, livelihoods and well-being, wealth distribution and national economic development in general. The sector is mainly a tuna-based fishery, which comprises of 90-95 percent of the total fish catch, while the remaining 5 percent consist of reef fisheries (16 percent in "low-tuna years"). In 2015, the fisheries sector accounted for 1.4 percent of GDP[4] and 11 percent of the labor force, and generated US$140 million in export revenue[5] (export revenue was highest in 2013 at US$163 million), which was almost all of Maldives' physical exports.

3. The Maldivian tuna is considered as a premium product due to high quality fish stocks, pristine water environment, and sustainable fishing methods (live bait, pole and line or hand line). The skipjack pole and line fishery has been recognized as one of the most environmentally responsible fishery operations in the world (certified by the MSC), a dimension that has helped sustaining the premium export prices in the recent past. On an average, during 2012-15, Maldivian tuna was priced at US$1,800 per ton compared to average prices of US$1,200 per ton of tuna in the relevant international markets (such as Thailand).

4. Maldives' economic development agenda is closely linked to its fisheries sector. This is not only because the country has very few opportunities to outgrow tourism and fisheries, but also because few other sectors has obvious potential for creating skilled and profitable jobs for the local population. Tourism may still grow, but the benefits of tourism development are not necessarily reflected in the local economy. Fisheries on the other hand, can grow and create additional profitable employment if sustainably managed. The lack of direct employment opportunities in fisheries in the last 15 years (direct employment reduced from about 30,000 in 1970s to 14,000 in 2001 to below 9,000 in 2015) is a big development concern given the fact that fisheries represent the single most important source of jobs in many islands, especially those that are not close to the capital or tourist resorts. Compared to any other vocation, fisheries is traditional in Maldives, and skill development for creating additional jobs could be comparatively easier. Based on these contexts, the Government had underlined in its Strategic Action Plan, the need to focus on fisheries for creating of additional jobs and economic value.

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[3] The South West Indian Ocean Fisheries Commission is a regional fisheries body under the Food and Agriculture Organization of the United Nations (FAO), whose objective is to promote the sustainable utilization of the living marine resources of the SWIO region and address the common problems of fisheries management and development faced by the member countries, without prejudice to the sovereign rights of coastal States.

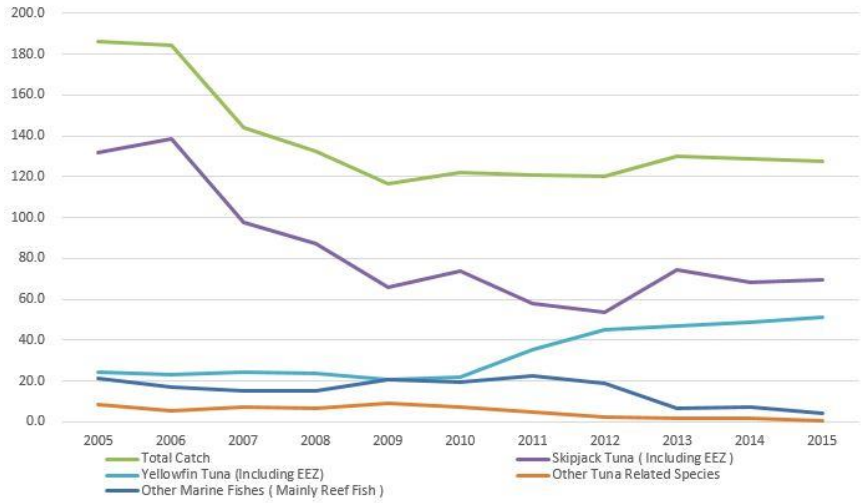
[4] This estimate does not include other sub-sectors where fishery has a major role: manufacturing (3.51 percent of GDP, and where most of manufacturing is based on marine capture fishery); wholesale and retail trade (4.67 percent), and transport (8.75 percent).

[5] "Basic Fisheries Statistics 2013", Ministry of Fisheries and Agriculture.

5. Fisheries activities in Maldives are intricately connected with the wellbeing of the regional fishery stock. In spite of using sustainable fishing practices, the capture of tuna has come down from about 185,923 tons to 127,400 tons in 2015 (with low total catches of 116,000, 122,200, 120,800 and 120,000 tons in 2009, 2010, 2011 and 2012 respectively, so much so that a catch of 120,000 tons is now considered to be the upper limit of sustainable harvest) – arguably due to the diminishing stock in the Indian Ocean as a whole. Maldives in recent years was focusing on yellow-fin tuna as one way of mitigating the reducing catch of skipjack tuna. In spite of practicing sustainable fishing in the Maldivian waters, the yellowfin tuna population in the Indian Ocean Region has shrunk, and the regional fisheries management organization, the IOTC, has now specified reduced quota for yellow-fin catch. Clearly, these regional level issues have had implications at the national level.

6. Reduced catch of skipjack and yellowfin tuna was compensated mainly by catch of reef fish during 2009-2012 (with catch between 19,100 to 22,600 tons) but plummeted during 2013-15 (6,600, 7,100 and 4,400 tons). The general agreement among stakeholders is that the reef fishing, especially capture of grouper which fetches the highest price, is at best uncertain.

Figure A2.1: Trend in Fish Catch in Maldives (thousand ton), 2005-15



7. The health of the ecosystem in the Indian Ocean is somewhat at risk, and it is expected that tuna catch will reduce further in the coming years. Given that fisheries represent the single most important source of jobs in many islands, sustenance of capture fishery at the current level of 120,000 tons is important for the national income and welfare of fishers and their families. The best option for Maldives is to work with other countries to ensure sustainable practices over all of the Indian Ocean Region. At the same time, Maldives needs to (a) augment its own systems, procedures, compliance mechanisms, and skills to retain the "environmentally sustainable" branding to capture premium price in international markets, and (b) offer to share the knowledge of its own systems, procedures, compliance mechanisms, and the "environmentally sustainable" fishing technology to the other countries. By demonstrating higher capture of value and premium price, Maldives can demonstrate to the other countries that conservation indeed pays.

8. The regional agenda for conservation (of tuna fisheries and of reef fisheries) is congruent to Maldives' national development agenda and interest. Inclusive development of fisheries sector is important, focusing on substantive job creation. In implementing such a conservation-linked development program (for mariculture and non-tuna diversified capture fishery), however, special attention will need to be given to the establishment of the appropriate policy and regulatory framework, the preparation of operational guidelines, mechanisms and rules, and capacity and skill building. These are all formidable tasks. However, Maldives is well poised to achieve these – based on its own fishing tradition and

knowledge; and will be able to offer sharing of such knowledge, skill and capacity developed in the proposed project with other SWIO Region countries.

9. The fisheries sector in the South West Indian Ocean (SWIO) countries is already largely regional, with each country's decision impacting the other countries' activities[6]. Efficient management, monitoring, and surveillance of the fisheries sector would contribute to positive growth in all countries. However, given that fishing activities are often considered as common goods, regional collaboration would be needed to ensure that fish stocks are enough to meet the future demands of the countries bordering the ocean. Platforms to innovate and close cooperation and coordination towards a regional objective are therefore essential. This would entail the need for enhanced regional connectivity through close partnerships and knowledge and technology-sharing across countries that face similar constraints. Once growth is harnessed, regional integration could help countries move towards higher-value markets, increased international trade, and additional investments.

10. An important share of the decision-making in the fisheries sector is already happening at the regional level, and this share is growing. Most of the Regional Economic Communities bordering the SWIO have regional fisheries policies with similar objectives and priorities (Southern African Development Community; the IOC; and the Common Market for Eastern and Southern Arica), but none of them cover all SWIO countries. To address their common concerns and needs related to fisheries, the countries have therefore created the SWIOFC.

11. Fishery remains a prominent source of livelihood in remote islands without a major tourism facility, and in the atolls away from Malé, 30 percent of the household heads work in the fishery sector. The importance of the fisheries sector to Maldives and Maldivians cannot be assessed solely by standard economic measures. Maldives produces less than an estimated 10 percent of the country's food requirements, reaching self-sufficiency in fish products only. Fisheries and trade in fisheries are the country's traditional production activity, and formed an integral part of the overall Maldivian social culture, i.e. social relationships, power structures and personal and national identity. It also needs to be noted that the full contribution of fishery (as primary production, as input and output from manufacturing sector, as direct input to tourism resorts, and as recreational fishery values) is perhaps not reflected in the national income accounts, and the National Statistical Bureau has initiated an exercise in collaboration with the Ministry of Fisheries and Agriculture to improve accounting for income from the fisheries sector in Maldives.

12. The challenges of the fisheries sector in Maldives are threefold. First, given the dependence of so many people from the inhabited islands on fisheries for their livelihood, **sustenance of capture fishery** (mainly tuna fisheries) at the current level of 120,000 tons is important for the national income and welfare of fishers and their families. Additional measures (such as compliance to IOTC resolutions on improved surveillance and monitoring[7]; or improved monitoring and generation of evidence to justify continuation[8] of MSC certification) will be important to sustain the exports. Operationalization of the Government of Maldives' decision to focus on all value-added processing of tuna, and a quality control limit for tuna fishing are also required. Other challenges include inefficient use of existing infrastructure, inadequate distribution, and lack of access to finance to invest in fisheries value chains.

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[6] For example: the migratory species, such as tuna, are archetypes of this shared regional public good, and their sustainable harvesting requires coordination to avoid a "tragedy of the commons" scenario.

[7] IOTC regulations require "observers on board" (or electronic observers) for a random sample of 5 percent of the fishing trips. Without implementation of this, export to EU is threatened.

[8] Recent analyses suggest, for the entire Indian Ocean (not necessarily for Maldivian EEZ), yellowfin tuna is already overexploited (and the capture of skipjack is already higher than the sustainable limit of 320,000 tons in the region). Continued MSC certification for tuna fishing in Maldives' EEZ depends on evidence that Maldivian EEZ is not overexploited.

13. The second challenge is to **ensure sustainability of the entire fishing sector**, especially with a focus on conservation of reef fishes. The reef fishery in Maldives is open access, not regulated, and anecdotal evidences show that it is already at risk. It is also evident from Figure A2.1 that targeted export-oriented reef fish stock has nearly collapsed (even if a full inventory or record of reef fishery including recreational fishery is not available). Maldives cannot afford to espouse the cause of conservation of tuna fishery (in its own waters and in the region) and at the same time destroy/diminish reef fishery. The high value tuna fishery depends on coral reefs. Degradation of coral reefs threatens sustainability of fisheries and tourism and it compounds the effects of climate change. Excessive reef fishing and capture of live-baits (for tuna fisheries) also threatens coral reefs. Further, Maldives needs to grow, and this need to grow threatens other parts of the ecosystem even if tuna fishing is at a sustainable level (say, with harvest slightly below 120,000 tons).

14. Sustainability of the resource is also jeopardized by an inadequate fisheries management and the limited knowledge and funding to create a path towards a more conducive business environment that can help enhance value-chain linkages and facilitate longer-term investments and research. Tuna and reef fisheries either are fully or over-exploited and catches are stagnating or declining. This is mostly due to suboptimal fisheries management, environmental change resulting in increased sea surface temperature, and probably high levels of illegal, unreported and unregulated (IUU) fishing in the EEZ. Development and management of capture fisheries is governed by the Fisheries Law of the Maldives. However, the emphasis of the law is mainly on protecting local fishers and the sovereignty of Maldivian waters, with little consideration of fisheries management: there are currently no management measures in place for the local harvesting sector. Some important steps have however already been undertaken: the fisheries licensing scheme was introduced in 2015, and the "Environmental Protection and Conservation Act" contains provisions to limit fishing for the conservation of biological diversity through 47 protected areas and natural reserves.

15. Third, **inclusive development of fisheries sector** is important for substantive job creation. Towards this, mariculture, diversified capture of relatively deep-sea species and aquarium fishery appear to be ideal for Maldives. Diversification into mariculture and consequent (partial) shift away from capture fishery (in particular for new entrants) is important on two counts: (i) to minimize impacts on coral reefs, and to sustain the reef fish population, especially groupers; (ii) to create dependable income and growth opportunities for communities and future generations, especially women who had been gradually excluded from the mainstay tuna fishing and related local processing operations, and who are involved in opportunistic reef fishing, and youth who have no readily available prospect for meaningful employment.

16. Even though the Government announced a policy of diversification in 2013, the opportunities for diversification are limited. Mariculture appears to be the only substantial opportunity for (i) reducing pressure on reef or bait fishing and divert new entrants into the tuna fisheries should fishing pressure not be increased; and (ii) providing meaningful employment opportunities including for women currently outside the gainfully employed workforce. Some initial mariculture works that have been implemented so far include pearl oysters, Maldivian clownfish, and brown marbled groupers. A private aquaculture farm is also producing sea cucumbers, producing the larvae in hatcheries before growing them in natural brackish water ponds and lagoons. The future development of mariculture, however, is hindered by limited availability of seed stock, financing and appropriate technology. Further needs include a well-defined legal and policy framework, development of value-chains, and facilitation for longer-term investment (such as for a state-of-the-art hatchery facility that can provide fingerlings to communities and private sector, development of efficient, high quality feed supplies and research). These are essential elements preliminary to the development of aquaculture to a scale where communities can start benefiting, and is key to nurturing the right business climate in which private sector operators will feel confident investing. Substantial efforts and resources are needed to make this happen; but without the development of mariculture, the entire strategic framework of sustainable fishing in Maldives will be at risk, thereby increasing the risk of unsustainable capture of reef and marine fishery, which would be detrimental to national and regional interests.

17. While Maldives' fisheries sector represents an undeniable potential engine of inclusive growth for the country, its sustainability and future will depend on three important and interrelated factors: (a) better and more transparent governance over fishing through all aspects of the value chain including post-harvest processing; (b) ensuring that greater value is captured across the value chain and that wealth generation opportunities are shared with marine resources-dependent communities, especially the women; and (c) improved livelihoods for coastal inhabitants and local stakeholders are squarely at the center of future sustainable mariculture development efforts.

18. The BAU Scenario and the Challenges: Figure A2.2 presents the baseline, the BAU scenario, as well as the challenges. At the regional level, the baseline is already alarming, as the overall regional catch of tuna is declining; and the yellow-fin tuna is already declared as threatened. Expert opinions suggest that IUU fishing in Maldivian EEZ (by non-Maldivian vessels; Maldivian industry does not have long-liners yet) catch up to an additional 50,000 tons of tuna, adding significant risk to Maldives' agenda of sustaining the tuna industry.

19. As the harvest of yellowfin tuna, which has compensated for decline in harvest of skipjack tuna since 2006, is now to be maintained within a regional quota; the overall harvest and employment in marine capture fishery has already reduced, and is expected to decline further. Some of the main destinations of export, such as the EU, already require compliance to and reporting on a stringent set of rules. In the BAU scenario, newer additional limits (quota) is expected which will further reduce the catch. It is also improbable that Maldives will be able to put up an effective system of monitoring and seizure of IUU vessels in Maldivian EEZ, and any increase of catch (by Maldivian vessels) by preventing IUU fishing is unlikely.

20. Even though the catch of tuna has declined, Maldives has been able to maintain the income from sustained premium prices. The premium enjoyed (about 50 percent over international market price) was possible because of the MSC certification; and widespread branding that Maldivian waters are not polluted. However, now the same certification and branding is at risk (and not only because of regional-level depletion of the tuna stock). To maintain the MSC certification and the environmental branding, it is important that all vessels should be brought under improved VMS that provides appropriate reporting and also serve the need for emergency rescue. Further, to accept imports of tuna from Maldives, it is crucial that at least 5 percent of the fishing trips of all vessels should have observers on board the vessels. Maldives had tried to comply with this IOTC requirement, but it is increasingly difficult to source such observers on board as the country does not have enough trained personnel to meet this requirement. As an alternative, an electronic observer system needs to be installed and established covering 5 percent (or slightly more) of all fishing trips by all vessels. Unless these actions are taken, the premium prices would be eroded, and will command price similar to the international average market price by 2020 (in which case, there will be a decline in income to the extent of nearly 60 percent compared to the current income).

21. Reef fishing has diminished already. Anecdotal evidences suggest that the size of average catches of grouper is now much smaller (about 25cm long) than what used to be caught in 2010 (about 40cm long). Although the reef fishing data is not systematically monitored, there is evident rapid decline in the catch of reef fish (see Figure A2.1). A major part of the issue is that the main catch is grouper (mainly for export to China as live fish or frozen). The best prices are commanded by a 'plate-size' fish (weighing about 500g), which means that there is an incentive to catch the smaller and younger fish, which are female, and as a consequence, the decline in stock is rapid. If the recent trend (see Figure A2.1, grave decline in catch of reef fish) continues, capture of grouper is highly vulnerable. A collapse of grouper fishery will impact the tuna fishery in Maldives also as the "environmental" brand of Maldivian fishery will be eroded. Given that the stock of groupers seem to be limited, disincentives for harvesting of groupers should be in place; detailed surveys of reef fishes should be undertaken, prior to any systematic and sustainable harvesting of groupers. As of now, the best option seems to be full protection of groupers (at least the smaller fish up to 1kg should not be harvested) even if larger fishes could be harvested along with augmented implementation of a "grouper management plan"; and conservation of small-size groupers as brood stock for grouper mariculture where the possibilities seem to be very encouraging.

Figure A2.2: Project Rationale (Baseline, Business-as-Usual Scenario, Challenges and Priorities)

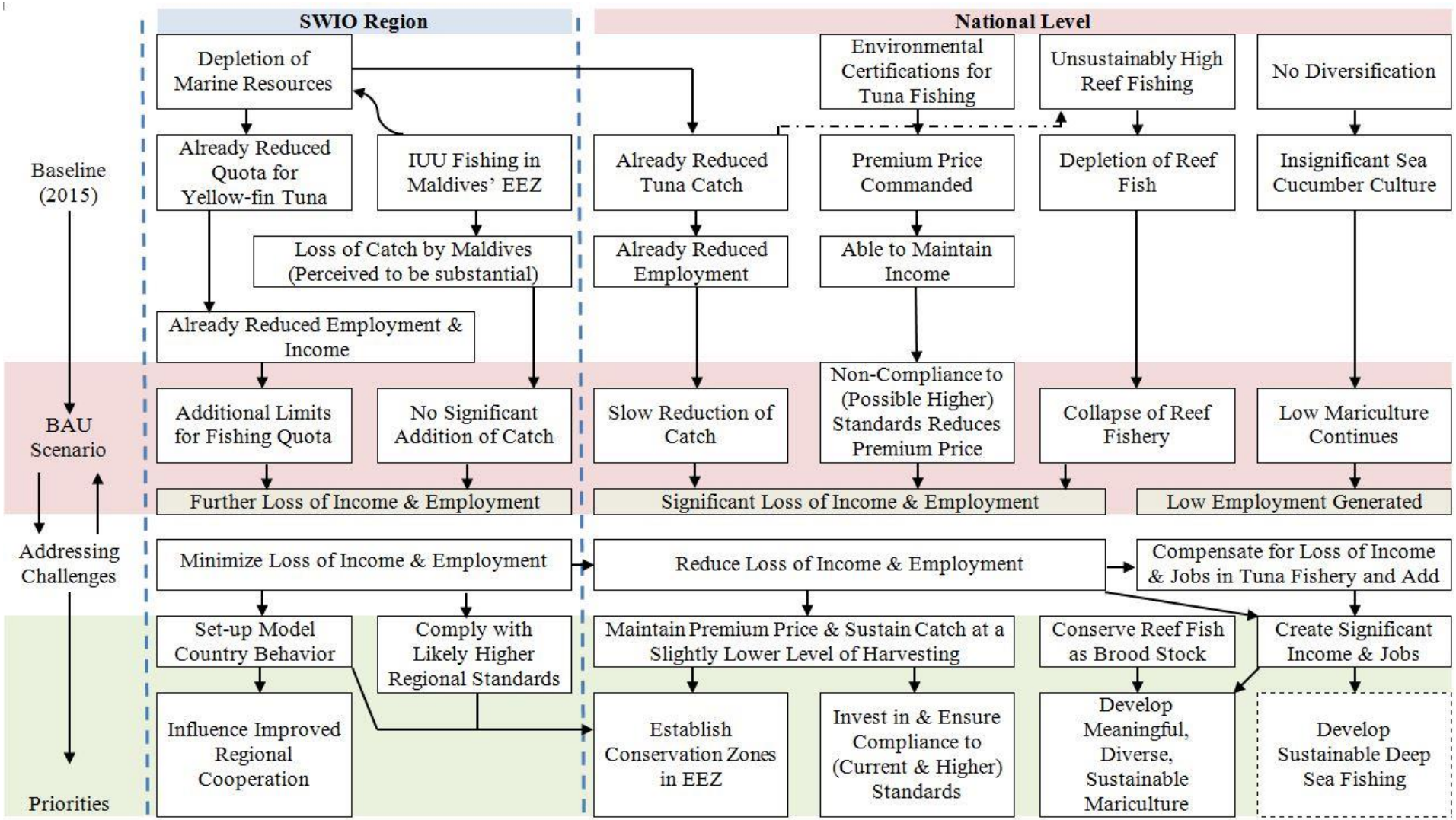


Table A2.1: Business-as-Usual Scenario: Harvest, Income and Employment from Tuna Fishing, Reef Fishing and Mariculture

	Tuna Fishing						Reef Fishing					Mariculture				
Year	Harvest (Ton)	Export (Ton)	Export Price (US$/Ton)	Income (Million US$)	Direct Jobs (Person)	Average Wage (US$/y)	Harvest (Ton)	Export (Ton)	Export Price (US$/Ton)	Income (Million US$)	Direct Jobs (Person)	Harvest (Ton)	Export (Ton)	Export Price (US$/Ton)	Income (Million US$)	Direct Jobs (Person)
2015	**127,400**	**71,000**	**1,800**	**188.71**	**9,554**	**7,792**	**3,510**	**3,159**	**30,000**	**20.51**	**2,632**	**0**	**0**	**30,000**	**0**	**0**
2016	121,487	71,804	1,786	187.84	9,411	7,792	3,259	2,843	30,000	17.84	2,219	100	100	30,000	3.00	100
2017	120,272	71,086	1,786	185.96	9,118	8,042	2,946	2,559	30,000	15.34	1,848	103	103	30,000	3.09	103
2018	117,867	62,698	1,786	178.16	8,836	8,299	2,665	2,303	28,800	12.92	1,508	106	106	28,800	3.05	106
2019	116,688	62,071	1,714	171.95	8,562	8,565	2,417	2,073	28,800	11.17	1,263	114	114	28,800	3.28	114
2020	115,521	61,450	1,714	170.23	8,296	8,839	1,965	1,658	27,360	7.99	876	123	123	27,360	3.37	123
2021	**109,745**	**58,377**	**1,629**	**153.63**	**8,039**	**9,122**	**1,606**	**1,327**	**26,813**	**5.89**	**625**	**132**	**132**	**26,813**	**3.54**	**132**
Change/2016	-9.7%	-18.7%	-8.8%	-18.2%	-14.6%	17.1%	-50.7%	-53.3%	-10.6%	-67.0%	-71.8%	32.0%	32.0%	-10.6%	18.0%	32.0%
2022	109,745	58,377	1,596	151.73	7,789	9,414	1,321	1,061	24,132	4.12	424	142	142	24,132	3.43	142
2023	108,648	57,216	1,596	149.36	7,548	9,715	1,096	849	24,132	3.13	312	153	153	24,132	3.69	153
2024	107,561	56,643	1,596	147.29	7,314	10,026	934	679	24,132	2.40	232	180	180	24,132	4.34	180
2025	106,486	56,077	1,596	145.26	7,087	10,347	815	543	24,132	1.86	175	212	212	24,132	5.12	212
2026	**105,421**	**55,516**	**1,596**	**143.25**	**6,867**	**10,678**	**701**	**407**	**23,649**	**1.34**	**121**	**249**	**249**	**23,649**	**5.89**	**249**
Change/2016	-13%	-23%	-11%	-24%	-27%	37%	-78%	-86%	-21%	-93%	-95%	149%	149%	-21%	96%	149%
2027	102,279	53,862	1,540	135.44	6,654	11,020	632	305	23,176	0.97	85	293	293	23,176	6.79	293
2028	99,231	52,257	1,540	130.89	6,448	11,373	598	229	22,712	0.71	60	344	344	22,712	7.81	344
2029	96,274	50,700	1,540	126.50	6,248	11,737	630	172	22,258	0.53	44	439	439	22,258	9.77	404
2030	93,405	49,189	1,540	122.26	6,054	12,113	703	129	21,813	0.40	32	560	560	21,813	12.22	475
2031	**87,903**	**46,291**	**1,400**	**108.14**	**5,866**	**12,501**	**821**	**96**	**21,377**	**0.31**	**24**	**714**	**714**	**21,377**	**15.26**	**558**
Change/2016	-28%	-36%	-22%	-42%	-38%	60%	-75%	-97%	-29%	-98%	-99%	614%	614%	-29%	409%	458%
2032	82,725	43,564	1,400	101.36	5,684	12,901	990	72	20,949	0.24	18	910	910	20,949	19.06	656
2033	77,852	40,998	1,400	95.01	5,508	13,314	1,220	54	20,530	0.19	14	1,160	1,160	20,530	23.82	771
2034	73,266	38,583	1,400	89.06	5,337	13,740	1,524	41	20,120	0.15	11	1,479	1,479	20,120	29.76	906
2035	68,950	36,310	1,400	83.49	5,171	14,180	1,920	31	19,717	0.13	9	1,886	1,886	19,717	37.19	1,065
2036	**64,889**	**34,171**	**1,400**	**78.26**	**5,011**	**14,634**	**2,431**	**23**	**19,323**	**0.11**	**7**	**2,405**	**2,405**	**19,323**	**46.47**	**1,251**
Change/2016	-47%	-52%	-22%	-58%	-47%	88%	-25%	-99%	-36%	-99%	-100%	2305%	2305%	-36%	1449%	1151%

22. Mariculture is currently limited. The IFAD-financed MEDeP started actual out-grower culture of sea cucumbers in mid-2016 (after waiting for 3 years to establish a multispecies hatchery in the private sector). In the BAU scenario, mariculture will remain limited to sea cucumbers (where there is a private hatchery which will be able to supply juveniles for rearing), and will grow after MEDeP at a rate of 2.5 percent per year. At this rate of growth, it will not be possible for mariculture to be established as an important sector; and further, it will not be possible to win people away from reef fishing, let alone tuna fishing, which is an important factor for successful sustenance of the tuna fishery.

23. Overall, in the BAU scenario (see Table A2.1 and Figure A2.2), the total income from tuna and reef fisheries sector will decline from US$208 million in 2015 to about US$160 million in 2021 (a decline of nearly 23 percent), and to US$145 million by 2026 (a decline of more than 30 percent). Similarly, direct employment in tuna fishery will reduced from 9,500 to about 8,000 by 2021 (reduction of 14 percent) and to below 7,000 by 2026. If all associated employment including reef fishing is considered, employment will reduce to 8,500 in 2021 and to 7,000 by 2026 from the current estimate of about 12,000. Loss of such a scale of jobs when there are very few alternatives available will be disastrous for the economy and well-being of Maldives. On the growth side, export-oriented mariculture in the BAU scenario will expand slowly from the base being created by MEDeP to eventually compensate substantially for the loss of income and jobs (by replacing 1,000 jobs, and income of US$46 million by 2036), but be unable to provide any meaningful income and employment in the short-term (2021 or 2026).

24. The BAU scenario is a conservative estimate. In fact, the grouper fishery could collapse earlier; the impact of restriction from the EU market could be greater compared to the potential new market in China as a result of the free-trade agreement. The premium prices could also erode at a faster pace. However, even this BAU estimate points to the urgent need for some interventions: (i) to act to ensure sustainability of the tuna fishery; (ii) to protect and conserve the reef fish, especially grouper; and (iii) to invest in mariculture and other diversification and value addition.

B. Project Design

25. Phasing: The current project is the first phase of an engagement in fisheries in Maldives through the SWIOFish SOP. Phasing is adopted to balance the need for large investment vis-à-vis the time required to achieve the objectives in a context where capacity constraints are significant. Fisheries management is, by itself, a long-term activity. Conservation of marine resources including reduction in unsustainable levels of fishing usually restricts growth in the near-term (even if it increases welfare at the same time, and protects jobs and income in the longer-term). The aim therefore, is to balance two parallel sets of activities:

A. Making fishing sustainable: activities that aim to reduce unsustainable practices, limit/curtail actions that create conditions in which substantial portion of current fisheries will collapse at a later date; and therefore, reduce the current unsustainable employment and income from current higher than optimum level of fishing – all that produce longer-term benefits, and sustain fisheries.

B. Creating new job and income opportunities from diversified fishery development including mariculture. This is required as the first set of activities (A) reduces jobs and income in the short term, and it is important to facilitate alternative sources of meaningful employment and income. A further need is that where alternatives are not easy to find, such as in Maldives, the first set of activities (A) cannot be implemented successfully unless and until attractive job opportunities are created away from capture fishery. In Maldives, very few alternatives exist, and the predominant tourism industry demands a skill-set that the people involved in fishing will take years to acquire. Therefore, diversification of fisheries sector including mariculture is the only realistic option.

26. To be successful in overall fisheries management, new job and income opportunities from set of activities (B) will need to be much higher than the potential loss of jobs and income from successful implementation of set of activities (A). Given that mariculture is nascent in Maldives, there are two ways of achieving this: (i) to invest hugely in set of activities (B), so that new activities such as mariculture starts

weaning people away from current reef and tuna fishing easily (by inducement of substantial incentives); or, (ii) to provide time and space for the new activities such as mariculture to grow, albeit slowly, to wean people away from firstly, reef fishery, and thereafter from tuna fishery. Option (i) is not suitable as large financing is not available, nor the current low absorption capacity in Maldives suggests that any larger investment will be successful. Note that the current low absorption capacity in Maldives is related to a number of factors: (a) limitation of contracting industry, due to which most of the skilled and unskilled labor, construction materials, goods and equipment are imported; (b) low project management capacity in the MoFA and its associated agencies, and in the other state enterprises; (c) lack of private investment in mariculture and other fisheries sector diversification and value-chains; (d) lack of access to finance, especially for fisheries sector where conventional land resources for mortgages for raising loan from commercial banks are absent; and, (e) the near absence of mariculture extension services. Any of these could be a major barrier to implement large projects/programs, and the combination of all factors substantially increases risk of implementing a very large project.

27. The preferred option, therefore, is to provide time and space; and continue engagement on incremental implementation of both sets of activities (A) and (B) mentioned earlier. As such, it is envisioned that a phased engagement could potentially be supported over the next 10 years, which would help Maldives develop diversified opportunities of job and income so that the conservation and management of fisheries sector as a whole in Maldives gradually becomes exemplary in the SWIO region.

28. The overarching Development Objective of the two-phase engagement will, therefore, be to increase the inclusive and sustainable growth of employment and income opportunities from the overall fisheries sector including mariculture and other diversified fisheries sub-sectors. The Results Indicators (all in sync with SWIOFish SOP objectives) would be as follows:

(a) Arrest the degradation of the status of fish stocks in Maldives' EEZ and consequently for the SWIO;
(b) Increase in the fisheries-related GDP, income and jobs, especially for women and youth in the remote atolls in Maldives; and
(c) Expand the value-chains to facilitate continually increasing diversified development and consequent increase in employment and income.

29. At the national level, the purposes of the two-phase engagement will be to enhance the government's capacity to manage (and govern)[9] the fisheries sector, including formulating appropriate adaptive sector policies; and to ensure sustainability of marine fisheries and development of mariculture as an important source of inclusive growth of economy, income and jobs, thus enabling it to respond to changing needs of the Indian Ocean Region.

30. The proposed phased engagement would be a two-phase operation to be implemented over a 10-year period. MoFA and all other relevant agencies of the Government of Maldives are eligible as implementing agencies, contingent on available funding and strategic fit to the World Bank's Regional Partnership Framework and the Country Partnership Framework in effect. The current project is the fourth project in the SWIOFish SOP, whereas the subsequent phases would extend, consolidate and build on the accomplishments of the project and other associated projects and studies financed by FAO, JICA, IFAD, and GEF [such as through the Bay of Bengal large Marine Ecosystem, and the Areas Beyond National Jurisdiction projects). Subsequent phases of engagement will also essentially be prepared based on human and institutional competencies and frameworks for sustainable fisheries management developed and nurtured by the current project.

[9] "Fisheries Management" is defined by FAO as "the integrated process of information gathering, analysis, planning, consultation, decision-making, allocation of resources and formulation and implementation, with enforcement as necessary, of regulations or rules which govern fisheries activities in order to ensure the continued productivity of the resources and the accomplishment of other fisheries objectives".

31. Benefits and risks. The specific phased approach is chosen essentially to reduce risk from committing huge investment in mariculture and other diversification value chains of fisheries given the low absorption capacity in the country. A further benefit is that gradual reduction of excessive catch (and consequent loss of traditional but unsustainable employment) is preferable as compared to sudden enforcement of conservation-oriented fisheries management regime, as alternatives to traditional fishing in Maldives will always be slow to emerge. Risks include the uncertainty about time, size and actual commitment of resources for Phase 2[10]. Although, the World Bank is not formally committing resources for Phase 2, it is likely that such resources including allocation of regional IDA will not be the most significant constraints. The most important factor for committing resources for Phase 2 will be the progress of implementation of the current project. To mitigate the risk of slow progress of implementation, design of the current project (i.e., Phase 1) includes avoiding activities that depend on sequential completion of other activities, and creating adequate implementation capacity within the PMU. Uncertainty of Phase 2 is also taken care by segregating result indicators for the current project (which has substantial targets) from those for a combination of Phase 1 and 2 together.

32. Design principles of the Phased Engagement are presented in Figure A2.3. The phased engagement will address the main issues at the SWIO region where Maldives can play the roles of both a beneficiary and a contributor to the regional fisheries management agenda. At the national level, it will address the challenges of inclusive economic growth, employment generation from and sustainability of a diversified fisheries sector. The project (fourth project of the SWIOFish SOP) will set up the initial capacities and demonstrations needed to attain the goal of the SWIOFish SOP, and the subsequent phases of engagement in Maldives (as may be appropriate) would extend, consolidate and build on the accomplishments of the project.

C. Project Components

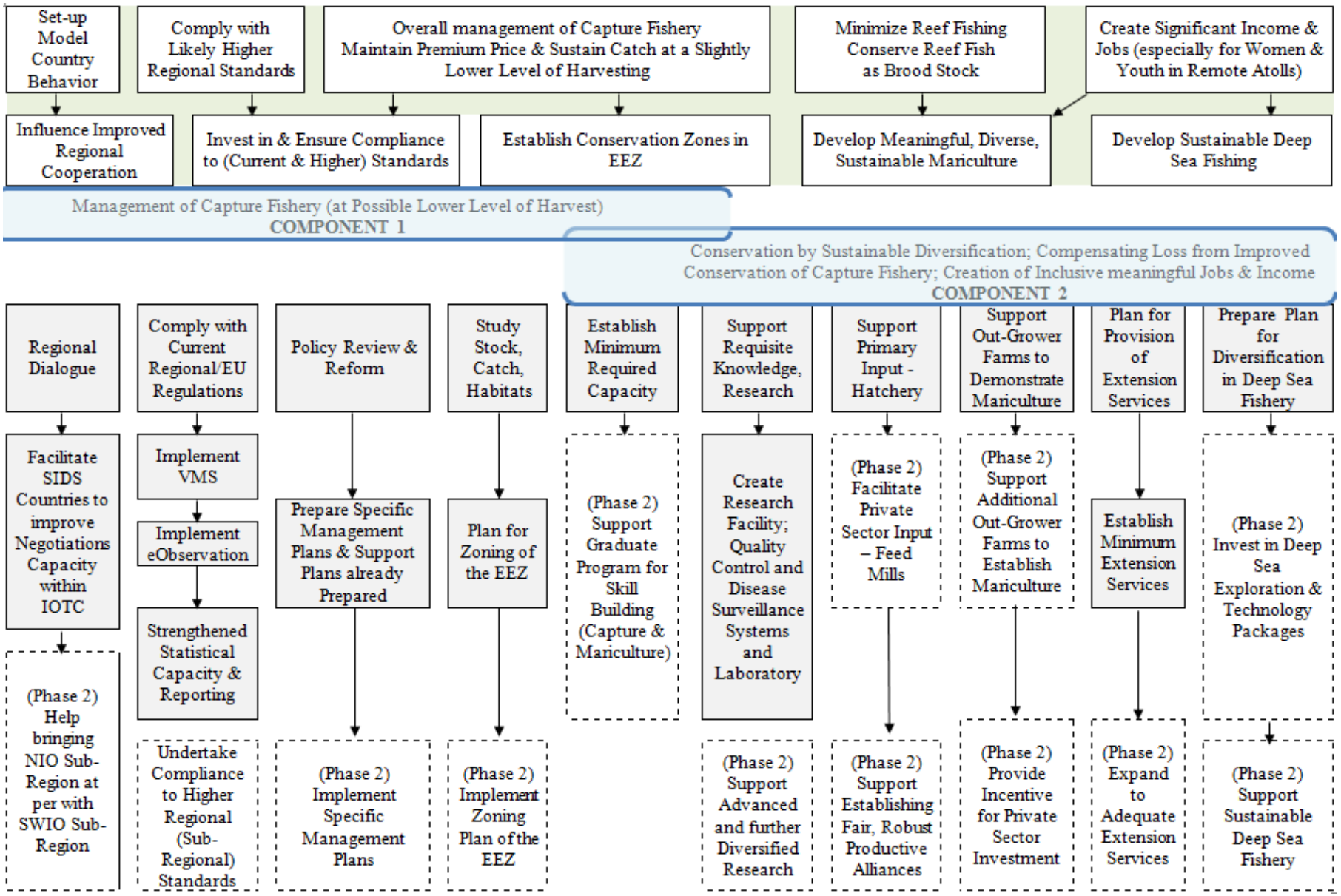
33. The PDO is to improve management of fisheries at regional and national levels including support to establish mariculture in targeted atolls in the Maldives. Note that (a) improving management of overall fishery is not possible without diversification to mariculture; (b) mariculture is attractive only due to the potentially high export revenue it could generate, which requires the overall management of the fisheries sector to continue to improve; and therefore, (c) the two parts of the PDO are dependent on each other. Further, it is worth noting that the PDO aims not only to initiate mariculture, but to "establish" on such a scale that the revenue earned is high enough to be a recognized alternative to reef fishing[11].

34. The project is aligned with government sector policy and in its design would center on the principles of sustainable management and governance of marine fisheries resources. The project components are also directly linked to wellbeing of the regional fishery stock. Other than 'Project Management, Monitoring and Evaluation', the project will consist of two components – one will focus on improving the currently inadequately managed capture fishery, and the other component will support diversifying the fisheries economy so that sufficient jobs and income are created outside capture fishery thereby reducing stress on the regionally shared fish stock resource. Both components will build improved resilience in Maldives. Provided below are summary descriptions of the interlinked components of the project.

[10] By definition, this Phase 1 cannot be wholly sustainable, without subsequent phases of the SOP. However, most activities in the current project will maintain momentum even if subsequent phases of SOP do not materialize. This necessitates a few critical sub-components, such as the multispecies hatchery to be implemented in Phase 1 as a whole, and cannot be distributed among phases.

[11] To establish mariculture as a prominent sub-sector in the economy of Maldives, an annual production level of about 3,000-5,000 tons in, say, 10 years is required (at which stage, private sector investments will replace the need for public financing) stage and niche markets will need to be tapped to maximize the export price. These mean that the role of a potential second phase is important.

Figure A2.3: Design Principles of Components of (i) the Phased Engagement in Maldives, and (ii) the Current Project



35. **Component A: Augmentation of Institutional Capacity for Marine Fisheries Management** (US$5.09 million). This Component, apart from the aim of enhancing the Government's capacity to implement a more effective fisheries sector monitoring and internal control system of key marine fisheries value chains, will also focus on delivery of the Indian Ocean Regional agenda as well as the intended national adaptation agenda of: (i) improving the overall fisheries management; and (ii) establishing marine zoning covering the entire Maldivian EEZ for long-term benefits. The component will also prepare a longer-term plan to establish and operationalize in-country skill and capacity building activities, to be able to create skills and capacities essential for sustenance and growth of the fishery sector in Maldives. The four sub-components are described below.

36. Sub-Component A1: Development of key fisheries management and planning instruments. This will include:

(a) Updating fisheries policy and legislative framework, which will include an assessment of the key monitoring and control issues in Maldives' commercial fisheries sector, and reforms needed for extension of MCS for tuna and reef fisheries to cover mariculture;
(b) Establishment of (i) zoning covering the entire Maldivian EEZ, in particular the nearshore and atoll water areas, and (ii) "potential fishing zone" program, by using technologies similar to what the Indian National Center for Ocean Information Services does;
(c) Training and workshops to support the grouper management plan currently in preparation by MoFA;
(d) Training and workshops to support selected coral reef management plans; and,
(e) Support to preparation of reef fishery management plans.

37. Sub-Component A2: Development and implementation of fisheries management activities will finance the following:

(a) Implementation of an expanded MCS, vessel registration and monitoring systems, electronic observer systems for commercial marine fisheries, and augmentation of reporting systems related to all of the above. All potential fishing vessels including vessels which are used part-time for fishing will be brought under the system of vessel registration and electronic observation;
(b) Collaboration with the SWIO Sub-Regional MCS Centers (e.g., SADC in Maputo, IOC in Mauritius), and appropriate potential replication at MoFA;
(c) Support and facilitation to SWIO regional agencies and international actors, including the EU, IOTC. Additionally, an option analysis for least cost surveillance program of the Maldivian EEZ will be prepared for future implementation (potentially, in collaboration with neighboring countries) by this sub-component.

38. Sub-Component A3: Support to long-term program for fisheries management. With respect to the capture fishery, this sub-component will finance:

(a) Strengthening the tuna sampling program;
(b) Reef fishery conservation zone surveys;
(c) Reef fishery stock assessment;
(d) Grouper stock and health assessment;
(e) Recreational fisheries sampling program; and,
(f) With respect to potential development of mariculture, this sub-component will also finance studies and development of protocols for disease surveillance and quality control of brood stocks and fish feed.

39. Sub-Component A4: Fisheries sector capacity building. The thrust of this sub-component will be development of local and national skills related to fishery management and mariculture. Mariculture including production of groupers and sea cucumber is not an easy process, and the out-grower farmers will need to be trained to get necessary bases in biology and farm management including control of seawater parameters, cage maintenance and cleaning, fingerling stocking, feeding, grading, growth monitoring, fish transfer and harvest. Also, extension services have to be implemented in order to help farmers during the

first years of production. The sub-component will help the out-growers in specific, and the personnel employed in fisheries in general, by financing the following:

(a) Short and medium-term skill-enhancement training of MoFA staff and other candidates selected by MoFA. Depending on the set of skills required, such training will be obtained from institutions and universities across the world;
(b) Development of curriculum and teaching aids for establishing and operating a future undergraduate program in Maldives; so as to be able to, in future (say, in Phase 2 of SOP), train a requisite number of students and trainees at an affordable cost especially to augment capacity to provide extension services that will be required once mariculture is established.
(c) Capacity building including collaboration with National Geographic Information System (GIS) to integrate conservation zoning, marine protected areas, potential fishing zone advisories;
(d) Development and operation of a fisheries management information system;
(e) Coordination and input to the National Bureau of Statistics to be able to correctly reflect the contribution of fisheries in the national economy; and,
(f) Study on the critical need for improving the fish export and processing sub-sector.

40. **Component B: Support to Mariculture and Diversification of Fisheries** (US$10.76 million). There is substantial prospect of economic growth by diversifying capture fishery, and equally substantial possibility of meaningful job creation in remote atolls from mariculture – both of which are pre-requisites for sustenance of the capture fishery resources in the Maldivian EEZ. Diversification into mariculture and subsequent gradual shift away from capture fishery is one of the priority adaptation measures including minimizing impacts on coral reefs (a very important resource for the region as a whole), and to sustain the reef fish population, especially groupers. However, mariculture is nascent in Maldives; and to be able to develop this sector, even at a demonstration scale, it is important that the primary inputs – seeds, feed and access to finance - exist. In addition, development and growth of fishery and mariculture are intricately connected with improved and new capacity for providing extension services, and consistent delivery of research and exploration. The minimum requirement, therefore is a combination of the following essential elements: (i) research, demonstration and extension, without establishment and continuity of which there will be neither diversification nor growth; (ii) a publicly financed "design, build, operate and transfer" (DBOT) contract for multispecies hatchery, without which mariculture cannot start[12]. Once the first set of demonstration farms are serviced by this hatchery, other such hatcheries are expected to be financed by the private sector in future; (iii) a sufficient number of household level mariculture out-grower farms, to be able to demonstrate technical and commercial viability, and attractive income for expanded number of households across atolls, without which mariculture of a viable scale capable of absorbing fluctuations in the export market will never be established; and (iv) initial support[13] for backward linkages such as supply of imported fish feed, and forward linkages such as connecting to collectors and exporters of mariculture products. This component is divided in four sub-components, described below.

41. Sub-Component B1: Development and demonstration of mariculture production and technology packages. The research center at Maniyafushi (i.e., the MRDF) has achieved good success in mastering breeding and growing of two species, the sandfish (*Holothuria scabra*) and the brown marbled grouper (*Epinephelus fuscoguttatus*). But now the center needs to diversify its researches to propose other mariculture species, e.g., new sea cucumbers species with a better growth and/or a better market in China,

[12] Except for sea cucumber, for which a private sector hatchery exists, and is currently partnering with the IFAD-financed Mariculture Enterprise Development Project.

[13] Once the demonstration out-growers farms are established and their production reaches a level where profits from export of mariculture products is comparable to the current profits from export of live capture reef fishes, it is anticipated that private sector will take up complementary investments in supply (and eventual manufacture) of fish feed; value chain development for new products; and enhanced networks and logistics to facilitate larger export. To avoid crowding out private sector investment or to avoid being perceived as disincentives to the entrepreneurs and private finance, the project does not finance these activities or elements (which, otherwise could be considered essential elements of any plan for mariculture development).

and new grouper species to propose a diversification in production and in export, and additionally other species that can become attractive for out-growing in the atolls (pearl oysters, for instance). Technologies to produce fish and mollusk, for example, are quite different, and MRC needs to be upgraded to permit experimentation in various types of species. MRC will need large facilities to be able to stock future breeders for the experiments, and will need to be involved in training of farmers, extension officers, biologists, etc. It will need all the facilities and equipment to conduct the required technical training including laboratories, accommodation, etc. Therefore, this sub-component will finance:

(a) Completion including operationalization of the MRDF (buildings, laboratories, equipment, brood stock tanks, hatching tanks, fattening tanks, and other facilities); and, preparation of medium-term operations plan for MRDC including service standards and operational manual, and a sub-plan for strategic cooperation with private sector;
(b) Development of technology packages for mariculture species such as grouper, milkfish, sea cucumber and their varieties for which operating costs (including for the disease surveillance, quarantine and quality assurance systems), additional staff including contractual staff and experts, technical capacity building and tie-up with foreign institutions for obtaining technology and exchange of experiences will be required;
(c) Demonstration of technology packages including training of trainers, workshops, field exposure, documentation and publication, and operating costs; and,
(d) Market studies, including assessment of the type of studies that will be required, and undertaking 3-4 select priority studies that recommends improvement throughout the mariculture value chain to ensure that all potential market risks could be analyzed in advance and measures could be taken to reduce risks, and the potential scope of expansion of mariculture.

42. Sub-Component B2: Promotion of mariculture out-grower schemes and seafood growth clusters. Considering the local species, the available technologies and the markets, project will develop two forms of small-scale mariculture in the atolls for sea cucumber and for grouper. Based on the research results from MRC and success of the hatchery {see B3(a) below}, other types of mariculture can also be tested in Maldives.

(a) Sea cucumber farming: Sea cucumber culture is already developed successfully, in a small number of cases, in the Maldives, but the project proposes to introduce a more intensive and more controlled process easy to be managed by small farmers. The project will provide handholding and extension support to household level farming in submerged cages, wherein each household has the possibility to have several cages (1 to 4 maximum)[14]. Sandfish (*Holothuria scabra*) will be reared, while other species would be used if the production process were mastered by the MRDF.
(b) Grouper farming: Grouper market is mainly oriented to the sales of live fish and chilled fish to the Chinese markets. Presently several Maldivian exporters are selling at high price, wild live groupers

[14] A typical model for sea cucumber farming involves cages made with welded iron bars covered with polyethylene plastic. Cage bottom is also in plastic but covered with sand. Size of a cage is 20x20m and 1m in height. Investment for one cage is around US$ 1,400. The cage will be stocked with sandfish juveniles (about 9 per m²). Feeding with a mix of local fish meal and imported vegetable by-products will be done twice a week. After 8.5 months, the average weight of sea cucumber is expected to reach 400g. Final harvesting will be around 1,037kg/cage. Sea cucumbers can be either sold to processors or processed by the farmer or a middleman (for gutting, cooking and drying) given a yield of 7 percent for dry product or a total dry weight of 73kg/cage. Minimum selling price for sea cucumber is expected to be US$4.6/kg for fresh product or US$63/kg for dry product. Total operating costs for one cage was estimated at US$2,120. Gross profit is estimated at US$2,590 per cage and per 9 months of rearing (around US$ 3,590 per year per cage). Operational efforts required including taking care of a cage is only for cleaning and feeding operations and can be easily performed by the women-owners (for a maximum 4 cages). Farming with four cages permits starting a growing phase every three months and get four harvests per year. Estimated monthly earning for a farmer will be around US$305 per month per cage. Environmental impact on the atolls will be low considering cultivation is done in sandy area with a poor bio-diversity and that cages are non-permanent facilities and shall be shifted away laterally every 3 years for allowing the substrate to quickly recover from oxygen depletion problems, if any.

at Hong Kong, SAR, China. This context makes culture of grouper highly profitable in Maldives. However, large intensive farms will not be viable now, as Maldives has no background in aquaculture practices and farmers will need to import most of the necessary farm inputs. The project will develop small-scale semi-intensive, household-level farms to produce groupers in order to reduce the operating costs. The project will support farming in floating cages located in deep lagoons (with minimum 10 m depth)[15]. The reared species will be the brown marbled grouper (*Epinephelus fuscoguttatus*) but other species could also be tried in year 3-5 of the project.

(c) Other potential mariculture: Other diversification could be attempted during the project implementation by using the same technologies with different but similar species: other sea cucumbers, other grouper species. It will be important to test the potential mariculture production of small fingerling to be used as baitfish for tuna fishing. Specific support will be provided to potential production of milkfish (*Chanos chanos*) fingerlings, a species already used as baitfish in other countries (such as Fiji and Indonesia), and culture of which is very important to sustain tuna fishery in Maldives. A mariculture production of baitfish will reduce the fishing pressure on small pelagic and/or reef fish. Other mariculture activities can be developed in Maldives, such as pearl oysters, but will need to be successfully demonstrated at the MRDF before actual out-grower culture.

43. Overall, this sub-component will finance:

(a) Assessment of carrying capacity and sustainable harvest levels in the remote atolls selected for the project;

(b) Workshops and training to ensure community custodianship of the coral reef resources;

(c) Mariculture development in the outer atolls including start-up investments in out-grower farms for sea cucumber, grouper and milkfish mariculture, development and training and advisory services in support of "small enterprise" business models, and for compliance to quality assurance and disease surveillance standards and protocols. All support will be provided directly through engagement of contractors for supply of juveniles, fish feed and supply and installation of the required small infrastructure (cages). During the initial years of implementation, once the multispecies hatchery contract progresses well, possibilities for leveraging the resources for expansion of the number of out-grower farms will be explored through potential establishment of a revolving fund with a partial risk guarantee to the Bank of Maldives; and if such instruments become acceptable, such changes will be established through a restructuring of the project.

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[15] A typical model for grouper culture involves a production unit of 8 square cages (3mx3m) with a net depth of 2m. Estimated investment for one unit is US$9,440 including floating cages, mooring system, nets, small boats and field equipment. Time to grow grouper from fingerling to commercial size (450g) is around 9 months. A farmer will be able to start a new production batch every 3 months by stocking 3,200 fingerlings in one nursery cage. Feeding will be done with imported pellets, where the feed conversion ratio (FCR) is estimated at 1:1.55. After 9 months, every production batch will harvest 1,224kg for a total yearly production of 4.9 tons. All grouper will be sold alive to local exporters for the Hong Kong, SAR, China market. Estimated selling price from farmer to exporter will be US$5.86 per piece (for fish smaller than 5kg). Total operating costs for a normal year will be around US$34,200. With total sales of US$63,800 per year, profit per farm will be around US$29,600 per normal year. During the first year of production, initial sales will only occur after 9 months and a working capital of US$23,500 will be needed for the first year of operation. Work to be performed in the farm is intensive: feeding 2 to 3 times per day, fish grading, net cleaning, harvesting, and the entire operation cannot be done by only one person; and the farm will be managed as a micro-enterprise settled by one or two households, with possibly the help of two wage earners. Total financing needs to implement a farm will reach US$33,000, an important amount which cannot be financed easily by households, and the project will support the out-grower farmers to develop their enterprise by financing loans for investment and for supply of working capital. Cage farming can have an important environmental impact if not developed properly. The selected lagoons for cages farming have to be studied prior to development in order to know water exchange rate between lagoon and open sea, currents and environment capacity to absorb farming wastes. Specific EIAs will specify how many cages can be established in each lagoon without harming the environment.

(d) Advisory support, either using incremental operating costs and PMU staff and/or consultants, to the household-level "small enterprises" for establishing out-grower contractual arrangements between themselves and larger private sector aggregators; relatively larger private sector aggregators could possibly be supported with expert advice on business planning for value chain development; and,
(e) Gender studies: (i) a gendered analysis of fisheries value-chain to identify specific entry points for women and youth; (ii) a behavioral diagnostic to promote youth participation in mariculture; and, (iii) communication and sensitization specifically aimed at women and youth.

44. Sub-Component B3: Supporting design, construction and operation of a multispecies hatchery. One of the most important bottlenecks in mariculture is to secure the supply of juveniles to farmers with the procurement of good quality and healthy juveniles for the reared species. Large projects can build their own hatcheries to produce their juveniles but small farmers cannot support this important investment cost. The import of juveniles (by changing applicable laws of Maldives which prevents import of live animals to maintain the pristine environment) could be a solution at the beginning, but it cannot be a sustainable activity for a long term operation considering the costs, the difficult control of the foreign hatcheries, the quality of juvenile and the potential risk of introducing diseases into the country. For these reasons, and considering grouper is a sensitive species in Maldives, the MoFA does not want to open the possibility of importing grouper juveniles. The supply of juveniles for small farmers will instead be secured by establishing one multispecies hatchery for three local species[16] of groupers, milkfish, and later for other interesting fish species[17]. Expected production in the third year of operation will be 5 million of juveniles. The work will include all the phases of hatchery implementation and operation: complete site study, feasibility study and business plan, environmental impact assessment, complete detailed design for the hatchery, full turnkey project for hatchery construction, program of breeder stock development, overseas training sessions for Maldivian biologists, and operation and maintenance for at least 3 years. This sub-component will finance establishment and operation of a multispecies hatchery, using a DBOT contract, which would remain under the ownership of Government throughout the period of the project.

45. Sub-Component B4: Scoping of long-term marine fisheries diversification studies. Given the regional level threat on the stocks of tuna, a long-term plan for diversification in deep-sea fishery is required. This sub-component is intended to prepare specific plans for deep-sea fishery explorations to be implemented in the subsequent phases of the SOP, especially for giant squids and red snappers including emperor red snapper (*Lutjanus sebae*), the ruby snapper (*Etelis carbunculus*) and the long tail ruby snapper (*E. coruscans*), which apparently have substantial possibility and market. It will also finance scoping of studies and protocols related to issues such as marine species to be caught, catching zones, depth, potential stocks, fishing season, markets, type of fishing boats, gears and technology, costs to modify the existing boats, approach of profitability (together called the "technology package"). Although, the "technology package" to be implemented in the subsequent phases of the SOP will expectedly contain certain aspects of the conservation needs, this sub-component will also prepare scoping of categorical "deep-sea fishery conservation plans", so that the intended diversification in future does not result in additional pressure on the deep-sea resources.

46. **Component C: Project Management, Monitoring and Evaluation** (US$2.15 million). This component would provide equipment, technical assistance, training, and incremental operating cost to

[16] The main species will be the brown marbled grouper and two other species will be chosen among the local available species in natural waters, such as the giant grouper (*E. lanceolatus*) or the camouflage grouper (*E. polyphekadion*), or if juveniles production process is mastered other species can be chosen.

[17] Note that the project will not develop hatchery for sea cucumber as a private farmer is already producing sandfish juveniles in the country. The MoFA will, separately propose incentives to other private entrepreneurs in order to develop additional sandfish juvenile production hatchery (and competition to the usually perceived monopoly), if required. For all private farms it is financially attractive to work with small farmers as satellite farms, supplying juveniles and feed and buying back the harvested products for processing and export.

strengthen the overall administrative capacity and capability of the Ministry of Fisheries and Agriculture and its PMU to manage, implement, and monitor and evaluate project activities. Specifically, support will include staffing and operation of the PMU; establishment of adequate financial management and procurement management systems; implementation of the communication plan and grievance redress activities; monitoring and evaluation (M&E) and third party audits; preparation and implementation of specific environmental impact assessments as per the national laws; coordination with other ministries such as the Ministry of Environment and Energy and other stakeholders (most likely including Bank of Maldives) and the private sector; and special evaluation studies as may be needed. The aim is that the appropriate staff of PMU and its operational systems will be transformed during the project period to merge back into the regular divisions of MoFA (see Annex 3 for details of the PMU). This component will also share monitoring protocols, evaluation studies and specific experience of implementation of various aspects of fisheries management activities that are of interest to the SWIO Region countries.

47. **Phase 2 of SOP**: A potential future phase (Phase 2) could be a repeater project, depending on the progress and results of this current Phase 1 project, availability of resources, and continued strong linkage to SWIOFish fisheries management agenda. Although the World Bank has not committed to a Phase 2 project (either as an additional financing or as a follow-on project), and without compromising the CPF and the priorities of the Government of Maldives, it is tentatively assumed that the Phase 2 project will focus on the following activities: (i) expansion of Component 1 - mainly fleet adjustment including incentives to modernize the fleet; expanding the creation of long term human resources capacities for managing both capture and culture fishery, including financing of operation of technical education program through the Maldivian National University; implementation of the management plans prepared in Phase 1, such as the grouper management plan, the live bait fishery management plan; and implementation of zoning regulations and plans prepared during Phase 1; (ii) expansion of Component 2 – mainly additional out-grower schemes for mariculture of grouper and sea cucumber; operation of full-fledged mariculture extension services; research, exploration, development of technology packages for newer fishery focused on deep-sea species[18], newer mariculture species such as pearls; development of value chain elements such as fish feed mills; (iii) support to facilitate fair productive alliances, so that additional private sector resources are mobilized for diversification of fisheries sector in a manner that results in rapid but inclusive growth; (iv) additional regional activities benefitting the SWIO region, including activities in support of other SWIOFish projects/programs, IOTC activities, and Northern Indian Ocean regional plans; and (iv) project management, similar to the Phase 1 project, but depending more on the human resources created under the Phase 1 project.

D. Linkage to South West Indian Ocean Region Agenda

48. Fisheries sector accounts for a substantial portion of Gross Domestic Product (GDP) of SWIO region countries. Seafood export from these countries was approximately US$2.7 billion[19] in 2014, more than half of it from tuna and shrimp. Local industrial fisheries (mainly shrimp) and tuna processing constitute a substantial part of employment, income and foreign exchange earnings. Aquaculture is one of the most rapidly growing food industries in several of these countries, and recreational fishing (sport fishing and diving) is a growing source of revenue. The fisheries sector is also a major contributor to nutritional health and food security in the SWIO region. The coastal rural population has often limited alternatives to fish for animal protein[20], as well as essential nutrients, vitamins, minerals and trace elements.

[18] Note that for these deep-sea species, and particularly red snappers, it is sometimes difficult to test a fishing zone and choice capture techniques, and several fishing experiments have to be performed considering the zones, the depth and the season.

[19] Estimate uses proportionate share of France. 22.68% of all French EEZ (11,691,000km^2) is in the SWIO region.

[20] Fish accounts for around 50 percent of animal protein intake in Comoros and Seychelles, 26 percent in Mozambique and Tanzania, 20 percent in Madagascar and Mauritius (FAO, 2007); and about 90 percent for Maldives. Maldives has the highest consumption of fish in the World, i.e., 144kg per person per year (WHO, 2015).

49. The SWIO marine fisheries are part of a larger marine ecosystem shared by all countries of the region. They are a regional public asset, whose health and sustainability require regional coordination to limit the negative and enhance the positive externalities yielded by national activities, especially on the migratory species, such as tuna. Conservation and sustainable harvesting of the regional public goods in particular, and the shared ecosystem in general are central to the economy of the island countries.

50. An estimated 28 percent of the SWIO regional fish stocks are over-exploited or depleted (especially the high-value resources, such as shrimp, lobster, and sea cucumber), and a further 40 percent are fully exploited (SWIOFC, 2011) from overfishing both by industrial vessels and artisanal fishers, widespread use of destructive equipment and techniques (such as dynamite or beach seines). As a result, critical ecosystems, already weakened by land-based pollution are further endangered by biodiversity loss, and destruction of coral reefs and mangroves. Consequently the resource base – a safety net upon which these poor coastal communities depend, is acutely threatened. Furthermore, a weak investment and business climate, coupled with limited or underperforming infrastructure and services, significantly constrain industrial and artisanal private sector development. As a result it was estimated that SWIO coastal states incurred annual losses of US$225 million[21] in 2008.

51. The fisheries sector in the SWIO is already largely regional, with each country's decision impacting activities of other countries. In particular, large national investments, such as ports, fishing fleets, or processing plants, are competing against each other. Regional coordination is therefore needed to avoid conflicts and suboptimal sectoral investments, and to promote equitable distribution of wealth. Furthermore, several technical aspects of the sector are regional in nature (e.g., monitoring, control and surveillance, and safety at sea), and their implementation, at the least, has to be coordinated at a regional level. The countries also face common constraints with regard to their fisheries sector including weak governance, weak human and institutional capacity, and a fragile business environment. The SWIO countries will therefore benefit from addressing these challenges jointly. They already use regional platforms to share their experience in implementing more sustainable and economically viable fisheries policies and practices, including the Indian Ocean Tuna Commission (IOTC) and SWIOFC. Greater regional cohesion will enhance the voice of these countries in international fora as well as in negotiating fishing-related agreements, where decisions taken have a significant impact on the fisheries sector of the SWIO countries.

52. In essence, an investment in sustainable fisheries development in Maldives will be beneficial to the countries in South-West Indian Ocean region, in the following ways:

(a) Benefit from economies of scale from shared infrastructure, technologies, and knowledge in terms of activities related to monitoring, control, and surveillance; safety at sea; and establishing a knowledge base on the impacts of climate change on the fisheries sector;
(b) Enhance the positive externalities yielded by national activities. The migratory species in the SWIO region, such as tuna, are archetypes of this shared regional public good and their sustainable harvesting requires coordination to avoid the "tragedy of the commons" scenario;
(c) Address common constraints jointly through regional platforms and workshops related to weak human and institutional capacity, fragile business environments, poverty reduction, food security, economic growth, balance of payments, value of natural capital;
(d) Greater regional cohesion in the international fora as well as in negotiations of fishing-related agreements where decisions need to be collective and impacts are shared; and
(e) Upgrade value-chain linkages by collectively helping their fisheries sector integrate into more competitive value chain through harmonized food and quality standards, market expansions, and creating other enabling regional environments for the rapid improvement of the sector.

[21] Estimation based on World Bank (2008), *The Sunken Billions: The Economic Justification for Fisheries Reform*.

53. All SWIO countries, with the exception of Maldives, have ongoing or recent World Bank engagements in fisheries, through analytical work, through IDA-funded investment projects, IFC investment in aquaculture, grant projects, and the former regional-GEF funded South West Indian Ocean Fisheries Project and the on-going WB/GEF-financed SWIOFish SOP. A regional-IDA financed project in Maldives will be a crucial part of conserving the important regional marine resources, and demonstrating that regional cooperation in such conservation of marine resources leads to sustained economic growth. SWIOFish1 passed the Regional Criteria screening process successfully and was approved by the Board in February 2015. SWIOFish Program contribution to support SIDS was highlighted during the last Spring Meetings.

54. Additionally, Maldives is already indirectly involved in the SWIOFish agenda. Maldives is participating in all the SWIOFC meetings supported by the SWIOFish1 project. The importance of Maldives for the SWIOFC agenda can be gauged by the fact that Maldives is currently co-chairing the SWIOFC (and is expected to take over as the chair soon), and that is why Maldives is participating in the SWIOFish Bureau meetings, the Scientific Committee Meetings, meetings of the Working Group on Fisheries Data and Statistics, and meetings of the Working Party on Cooperation and Coordination in Tuna Fisheries. The priority aim of SWIOFC is to establish minimum terms and conditions for the region for accessing the tuna fisheries.

55. Maldives also benefits from SWIOFish1 regional support to develop a National Observer Program, in line with the IOTC's recommendations, to eventually be able to participate in the SWIOFC Countries' Regional Observers Program. Under SWIOFIsh2 Projects, Maldives will benefit from training by IOTC Secretariat's technical teams to better implement Maldives' international fisheries obligations under the IOTC, such as the Port States' Measures to combat Illegal, Unreported and Unregulated fishing. Maldives will also use some of the resources in this project to do more than mere alignment with SWIOFish.

56. Maldives has a long established tradition and culture of a highly selective form of tuna fishing that is now hailed as one of the most environmentally sustainable forms of tuna fishing. This fishery was certified in 2012 by the MSC and as a result the catch and its products fetch a premium price at European markets. Also as a result of the MSC Certification Maldives has strengthened engagement with the IOTC and SWIOFC in particular on long term management of the resource. Some of the achievements include taking lead in building and maintaining a coastal state alliance, taking leadership in setting up biological reference points for the key IOTC species and helping to pass a resolution on harvest control rules for skipjack tuna. Maldives is keen to maintain the coastal states alliance to make members aware of common issues (e.g., on allocation principles) and building collective support for issues of interest common to the coastal states. The project therefore will support Maldives (i) to host and facilitate other countries, through regular workshops and meetings especially the small island developing countries to a higher level of SWIOFish cooperation, especially as Maldives is the incoming chair of SWIOFC; (ii) to host researchers and students from other Indian Ocean region countries in research activities in Maldives; (iii) share data and research results, monitoring protocols and evaluation results to all SWIO Region countries; and, (iv) based on examples set out by Australia, host dialogue on conservation and leadership in the Indian Ocean region.

57. As the fourth project in the SWIOFish SOP, the Project meets the criteria for accessing regional IDA: (a) the SOP currently directly involves six countries; (b) it supports policy harmonization for ecological connectivity and regional integration in the Indian Ocean Region; (c) it has spillover benefits, and avoids negative spillover impact at the regional level beyond the country boundaries; and (iv) the project, through continued support to the SWIOFC, provides a platform for a high-level of policy harmonization between countries and is part of a well-developed and broadly supported regional strategy. The following is a detailed description of the linkages between the project components/sub-components, and the regional agenda for the Indian Ocean.

Table A2.2: Linkages between Project Components and the South West Indian Ocean Regional Agenda

Component / Sub-Component	Description of the Components & Sub-Components	Linkage to the South West Indian Ocean Region Agenda
Component A: Institutional Capacity in Marine Fisheries Governance		
(Sub-Component A1) Development of key fisheries management and planning instruments.	This includes (i) updating fisheries policy and legislative framework, which will include an assessment of the key monitoring and control issues in Maldives' commercial fisheries sector, and reforms needed for extension of MCS for tuna and reef fisheries to cover mariculture; (ii) establishment of zoning covering the entire Maldivian EEZ, in particular the nearshore and atoll water areas, and establishment of "potential fishing zone" program, by using technologies similar to what the Indian National Center for Ocean Information Services does, (iii) support to the grouper management plan currently in preparation with technical assistance from FAO, (iv) support to selected coral reef management plans ; (v) support to preparation of reef fishery management plans; and (vi) workshops and training, as required related to above.	Assessment of key monitoring and control issues in Maldivian waters is directly linked to the issue of wellbeing of the regional fishery stock. Expert inputs and training will focus on responsibilities as part of SWIO region. Management of reefs/ coral are essential for the regional conservation; and for improved compliance with IOTC conservation and management measures. Zoning is an integral part of the conservation agenda of regional fishery stock. Expert inputs from other countries of the Indian Ocean Region will be used in establishing a "potential fishing zone".
(Sub-Component A2) Development and implementation of fisheries management activities.	This will include (i) implementation of an expanded MCS, vessel registration and management systems, electronic observer systems for commercial marine fisheries, and augmentation of reporting systems related to all of the above. All potential fishing vessels including vessels which are used part-time for fishing will be brought under the system of vessel registration and electronic observation; (ii) collaboration with the SWIO Sub-Regional MCS Centers (e.g., SADC in Maputo, IOC in Mauritius), and appropriate replication at MoFA; (iii) support and facilitation to regional and international actors, including the European Union and the Indian Ocean Tuna Commission. Additionally, least cost surveillance program of the Maldivian EEZ will be initiated (potentially, in collaboration with neighboring countries) by this sub-component.	The expansion of appropriate use of vessel monitoring systems and electronic observer systems are essential for compliance with IOTC requirements. Maldives needs to augment its own systems, procedures, compliance mechanisms, and skills to retain the "environmentally sustainable" branding to capture premium price in international markets. Support to regional actors, and facilitating collaboration of small island countries among the Indian Ocean countries (by convening at least one workshop including communication and background analyses that might be required based on agreed themes, prior to annual meetings of IOTC to discuss conservation and management measures), and partnership with SWIO sub-regional centers are obvious linkages.
(Sub-Component A3). Support to Long-Term Program for	With respect to the capture fishery, this sub-component will finance (i) strengthening the tuna sampling program, (ii) reef fishery conservation zone surveys, (iii) reef fishery stock assessment, (iv) grouper stock and health assessment, and, (v) recreational fisheries sampling program. With	Sustainability of the entire fishing sector, especially with respect to reef fishing is part of the regional agenda. The high value tuna fisheries sector – an important resource for many countries is dependent on reef fish, and consequently on the conservation of

Component / Sub-Component	Description of the Components & Sub-Components	Linkage to the South West Indian Ocean Region Agenda
Fisheries Management	respect to potential development of mariculture, this sub-component will finance (vi) studies and development of protocols for disease surveillance, quality control of brood stocks and fish feed.	coral reefs (degradation of coral reef represents a threat to the sustainability of fisheries and tourism, as well as compounding the effects of climate change). Reef fishing as well as capture of live-baits (for tuna fisheries) is considered a threat to corals. The sampling and assessments will help develop deeper understanding of the stock and sustainable yield of marine resources, which will contribute to regional stock assessments and consequent actions. Diversification into mariculture is a good thing provided biological impacts and risks of gene pool contamination is managed appropriately. These activities are not only linked to the regional agenda, but these could also establish good practice documents to be shared and implemented across a number of SIDS.
(Sub-Component A3A-to be undertaken in the future Phase) Implementation of Select Actions from the Long-Term National Program for Fisheries Management	Based on the Plans prepared in the current project, in the future Phase, these would be used to implement some or all of the above-listed studies and assessments. A full-fledged plan for, say, recreational fishery could be implemented. Conservation zones and the specific rules will be established, and ecosystem wealth will be accounted. Additional management measures will be implemented based on initial and periodic stock assessments; and the plans such as the grouper management plan will be implemented.	Maldives will offer to share the knowledge of its own systems, procedures, compliance mechanisms, and the "environmentally sustainable" fishing technology with the other countries. The sampling and assessments will help develop deeper understanding of the stock and sustainable yield of marine resources, which will contribute to regional stock assessments and consequent actions. Although diversification to mariculture is part of the regional conservation agenda, protocols for disease surveillance, quality control of brood stock and fish feed are needed so that the conservation ideals are not flouted.
(Sub-Component A4) Fisheries sector capacity building	The thrust of this sub-component will be development of local and national skills related to fishery management and mariculture: by financing (i) short and medium-term skill-enhancement training of MoFA staff and other candidates selected by MoFA. Depending on the set of skills required, such training will be obtained from institutions and universities across the world; (ii) development of curriculum and teaching aids for establishing and operating a future undergraduate program in Maldives; so as to be able to, in future, train a requisite large number of students and trainees at an affordable cost especially to create	The local and national skills and capacities developed in the project will be beneficial to the SWIO Region as a whole, as (i) the human resource and the skills developed will be available to the other SIDS countries as per requirement or as per SWIOFish regional agenda; as these skills, such as for quality and disease management, are not currently available in most small island countries of the SWIO Region; (ii) in next phase, when a regular undergraduate program starts in Maldives, opportunities for enrollment and student exchange program will be available to all

Component / Sub-Component	Description of the Components & Sub-Components	Linkage to the South West Indian Ocean Region Agenda
	augmented capacity to provide extension services that will be required once mariculture is established. Capacity building will also include (iii) collaboration with National GIS to integrate conservation zoning, marine protected areas, potential fishing zone advisories; (iv) development and operation of a fisheries management information system; and (v) coordination and input to the National Bureau of Statistics to be able to correctly reflect the contribution of fisheries in the national economy.	SWIO Region countries; (iii) the improvement of national statistics to include all forward linkages in employment and economy will have a potential of replication in other SWIO Region countries (where fishery sector is also not fully reflected in the economic surveys). Further, the integration of conservation plans in the National GIS is important for operationalization of the conservation plans, which is important for the Component A2 described above, as well as for the SWIO Regional fisheries management agenda.
(Sub-Component A4A- to be undertaken in the future Phase) Fisheries sector capacity building.	In Phase 2 of SOP, this will finance establishing and operating an undergraduate program at the Maldives National University. The expenditures will include teaching including collaboration with foreign universities, grant towards tuition fees and scholarships to a batch of 30-50 students per year. Additional skill enhancement will be done through short, medium and long-term training of MOFA staff and other graduate students selected by the MOFA. Activities such as operation of a fisheries management information system; and coordination with the National Bureau of Statistics will continue. Substantial additional resources will be dedicated to creation of a dedicated full-time extension services for the fisheries sector (including mariculture).	Although the aim is to build capacity in-country, this sub-component will (i) facilitate / or provide training of students/candidates from other island countries; (ii) share the information and training modules with all SWIO countries. The Maldives National University will collaborate with other SWIO countries to develop the undergraduate program, and network with other universities across the world so that faculty and students in those places are also benefitted from this undergraduate program (e.g., by student exchange programs).
Component B: Support to Mariculture and Diversification of Fisheries		
(Sub-Component B1) Development and demonstration of mariculture production and technology packages.	This sub-component will finance: (i) completion including operationalization of the MRDF (buildings, laboratories, equipment, brood stock tanks, hatching tanks, fattening tanks, and other facilities); (ii) development of technology packages for mariculture species such as groupers, milkfishes, sea cucumbers and their varieties for which operating costs (including for the disease surveillance, quarantine and quality assurance systems), additional staff including contractual staff and experts, technical capacity building and tie-up with foreign institutions for obtaining technology and exchange of experiences will be required; (iii) demonstration of technology packages including training for trainers, workshops, field exposure, documentation and publication, and operating	Diversification into mariculture and consequent (partial) shift away from capture fishery (in particular for new entrants) is important for conservation within the Maldivian waters, which is an important part of the shared Indian Ocean region. Appropriate research will need to take place prior to actual implementation of diversification into mariculture. This sub-component will finance all such required research. Additionally, Maldives will offer: (i) research results to be available for all island countries of the Indian Ocean Region; and (ii) researchers from other countries, island countries in particular, to join the research program at the MRDF. The research center will also tie-up with foreign institutions of

Component / Sub-Component	Description of the Components & Sub-Components	Linkage to the South West Indian Ocean Region Agenda
	costs; and (iv) preparation of medium-term operations plan including service standards and operational manual, and a sub-plan for strategic cooperation with private sector.	repute – for conceptualizing and designing the required research program and the extension services.
(Sub-Component B1A – to be covered under the future Phase) Development and demonstration of mariculture production and technology packages.	This sub-component will expand financing for development of technology packages for new and additional mariculture species such as pearl oysters for which operating costs (including for the disease surveillance, quarantine and quality assurance systems), additional staff including contractual staff and experts, technical capacity building and tie-up with foreign institutions for obtaining technology and exchange of experiences will be required; (ii) demonstration of technology packages including training for trainers, workshops, field exposure, documentation and publication, and operating costs; and (iii) implementation of some of the medium-term operations plan including service standards and operational manual, prepared in the current project.	
(Sub-Component B2) Promotion of development of mariculture out-grower schemes and seafood growth clusters.	This sub-component will finance (i) community-based assessment of carrying capacity and sustainable harvest levels, planning and implementation of coral reefs in the atolls selected for the project; (ii) community custodianship of the coral reef resources; (iii) mariculture development in the outer atolls including start-up investments for sea cucumber and grouper mariculture; development and training and advisory services in support of "small enterprise" business models, and for compliance to quality assurance and disease surveillance standards and protocols.	Diversification into mariculture and consequent (partial) shift away from capture fishery (in particular for new entrants) is important on two counts: (i) to minimize impacts on coral reefs, and to sustain the reef fish population, especially groupers; (ii) to create dependable income and growth opportunities for communities and future generations, especially women who had been gradually excluded from the mainstay tuna fishing and related local processing operations, and who are involved in opportunistic reef fishing. The agenda of conservation of reef and waters, reef fishery, and development of mariculture as the best diversification option, therefore are closely linked to the SWIO regional conservation agenda.
(Sub-Component B2- to be covered under the future Phase) Promotion of development of mariculture out-grower schemes	This sub-component will finance expansion of two activities - (i) community custodianship of the coral reef resources; (ii) mariculture development in the outer atolls including loans/grants towards start-up investments for sea cucumber and grouper mariculture, and for other potential species; (iii) support to "small enterprises" for establishing out-grower contractual arrangements between small producers and larger private sector aggregators; and, (iii) providing expert support to relatively larger private sector aggregators on business planning.	

Component / Sub-Component	Description of the Components & Sub-Components	Linkage to the South West Indian Ocean Region Agenda
and seafood growth clusters.		
(Sub-Component B3) Supporting design, construction and operation of a multispecies hatchery.	This sub-component will finance: design, construction, operation and maintenance of a multispecies hatchery, using a DBOT contract.	Sustainability of the resource, including from diversification into mariculture is jeopardized by the limited knowledge and funding to create a path towards a more conducive business environment that can help enhance value-chain linkages and facilitate longer-term investments and research. This sub-component, in support of the sub-components above, will support essential elements of value-chain development and enhancement (a multispecies hatchery being the most important element of the appropriate value-chain). These are part of Maldives' intended contribution to the Indian Ocean Region to demonstrate and inspire integrated value-chains to sustain fisheries based national economy. By upgrading value-chain linkages in fisheries sector and becoming more competitive (including attention in other sub-components on harmonized food and quality standards) Maldives will demonstrate market expansions, and help create enabling environments for the rapid improvement of the sector, which will be possible for other island countries of Indian Ocean to replicate.
<u>(Sub-Component B3A- to be covered under future Phase)</u> Supporting value-chain enhancement.	This sub-component will finance: (i) potential expansion of the multispecies hatchery set up in the project in the future Phase; (ii) support to the private sector aggregators on business planning for value chain development; and, (iii) partial risk guarantees for selected private sector value chain investments to attract private sector enterprises to partner with the project for long-term sustenance of the project activities, especially mariculture out-growers.	
(Sub-Component B3) Scoping of long-term marine fisheries diversification studies.	Given the regional level threat on the stocks of tuna, a long-term plan for diversification in deep-sea fishery is required. This sub-component will finance scoping of the studies and explorations required for species such as giant squids and red snappers, which have substantial possibility and market. Scoping will include the intended technology package, and categorical "deep-sea fishery conservation plans", so that the intended diversification does not result in additional pressure on the deep-sea resources.	In Maldives, more than 90 percent of the effort is focused on capturing tuna. This add to the enormous stress on the tuna resources of the region. A potential mitigation is diversification to other deep-sea species, so that stress on tuna does not grow any further. Explorations and establishment of technology processes will enable shifting the single-minded focus on tuna fisheries, which in turn will make conservation regime for tuna so much more acceptable by communities. The "deep-sea fishery conservation plans" will ensure that this diversification does not result into additional pressure on the deep-sea resources (which might not have abundant stock); this could be a replicable best practice.
<u>(Sub-Component B4A- to be covered under the future Phase)</u> Development	This sub-component will finance deep-sea fishery explorations and stock assessment for several potentially beneficial fish species. It will also finance studies and protocols related to issues such as marine species to be caught, catching zones, depth, potential stocks, fishing season, markets, type of fishing boats, gears and technology, costs to modify the	

Component / Sub-Component	Description of the Components & Sub-Components	Linkage to the South West Indian Ocean Region Agenda
and demonstration of marine fishery production and technology packages.	existing boats, approach of profitability (together called the "technology package"). It will provide finance to implement the "deep-sea fishery conservation plan.	
Component C: Project Management, Monitoring and Evaluation		
Component C: Project Management, Monitoring and Evaluation	This component remains unaltered from the scope agreed in the previous missions. This component would provide equipment, technical assistance, training, and incremental operating cost to strengthen the overall administrative capacity and capability of the Ministry of Fisheries and Agriculture to manage, implement, and monitor project activities, including the monitoring of the project's procurement, financial management, environmental and social safeguards requirements.	As this component only supports and oversees the implementation of Components A and B (which are essentially entirely linked to the SWIO Regional fisheries management agenda, as described in detail above), the linkages are proportional to the linkages contained in those Components A and B. However, in addition, this Component C will include: (i) direct sharing of monitoring protocols and evaluation reports which are also important for monitoring and evaluation of SWIOFish1 and SWIOFish2 projects; (ii) provide support to Maldives in its role as the incoming chair of SWIOFC; and, (iii) facilitating exposure to Maldives to learn directly from the experience of implementation of various fisheries management activities in Maldives which are of interest to other SWIO Region countries. The knowledge sharing methods will include: (i) "knowledge-sharing" events such as workshops, visits of delegations of the SWIO countries to Maldives; and (ii) sharing all evaluation reports with SWIO SIDS, (iii) inviting SWIO country researchers to MRDF. For each type of method listed above, at least one event will take place during the project (and be scaled up in the potential future phase).

Annex 3: Implementation Arrangements

MALDIVES: Sustainable Fisheries Resources Development Project
(Fourth South West Indian Ocean Fisheries Governance and Shared Growth Project)

Project Institutional and Implementation Arrangements

1. MoFA has the sole mandate, jurisdiction and experience in managing fisheries, and therefore, is the obvious choice to lead project implementation. However, the MoFA has a large mandate, but limited staff. There is a need to increase staff in most divisions of the MoFA including the divisions responsible for compliance monitoring, implementation of mariculture activities, training and extension – who will be involved in preparation and implementation of the project. Given the reduced working hours of the government staff in Maldives, it is unlikely that the existing staff will be able to provide any time for the project. A special purpose vehicle in the form of a PMU, with adequate number of technical staff, including expert staff on mariculture, aquaculture research, and market studies, environmental management, social inclusion (gender), financial management, financial planning, and procurement was, therefore, deemed necessary.

2. The responsibilities of MoFA including the Steering Committee include providing national policy and implementation framework; approval of the project and securing the required budget from the MoFT; approval of the project's overall annual action plans and annual budgets; and overall implementation oversight. MoFA will also ensure that most of the project activities are duly executed by its regular divisions and field offices.

Project administration mechanisms

3. MoFA has set up a PMU to manage the project; coordinate project activities on a full-time basis and directly execute some of the project activities. Even if most activities will be implemented by the regular divisions of the MoFA, these would be monitored and facilitated by PMU. The PMU will be responsible for leadership of implementation; facilitating statutory clearances including environmental permits; procurement of works, goods and services (where larger ones are to be approved by the Steering Committee); and implementation of specific capacity building activities.

4. The PMU organizational structure resembles the structure of the MoFA. This is important because: (a) the actual execution of project activities will take place using the MoFA divisions and their field offices, and a clear coordination between the PMU and the relevant MoFA division is needed, as PMU staff will be deputed in those divisions and field offices; (b) an appropriate part of the additional expertise and staff created under the PMU will possibly need to be absorbed in the respective MoFA divisions at closure of the project, so that the long-term capacity created is not lost, and used for sustenance and expansion of the outcomes of the project, including as anticipated for future phases of the SOP; (c) even if most of the staff will be recruited from market (including expatriate consultants given the shortage of qualified fisheries experts in Maldives), the organizational structure of the PMU would be such that it becomes easy for MoFA to depute their permanent staff of regular divisions to the PMU in a manner that the staff could clearly see career advantages if they join the PMU (and be back to their parent divisions when the deputation is over). See Figure A3.1, below.

5. The PMU will collaborate with, seek support from, and partner with a range of other agencies to strengthen the capacity of the main implementing actors. These will include international knowledge centers, including the World Aquaculture Alliance; academic and research institutes including the Maldives National University; private sector business houses and industries including the Maldives National Chamber of Commerce and Industry; civil society groups, atoll level community organizations and other government departments responsible for development and protection of marine resources (such as the MoEE).

Figure A3.1: Organizational Structure of MoFA, and Departments/Divisions Responsible for Implementation of the Project

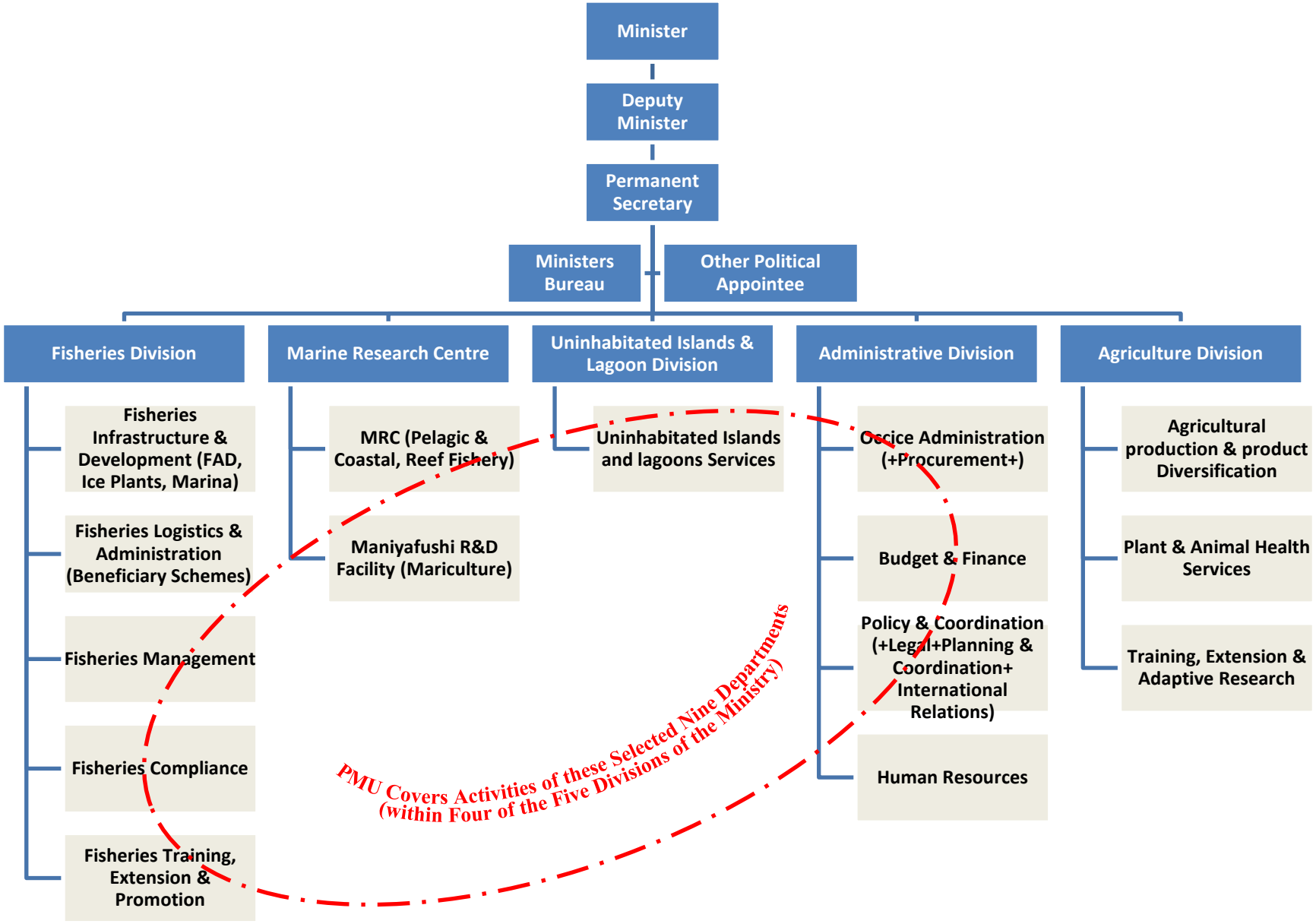
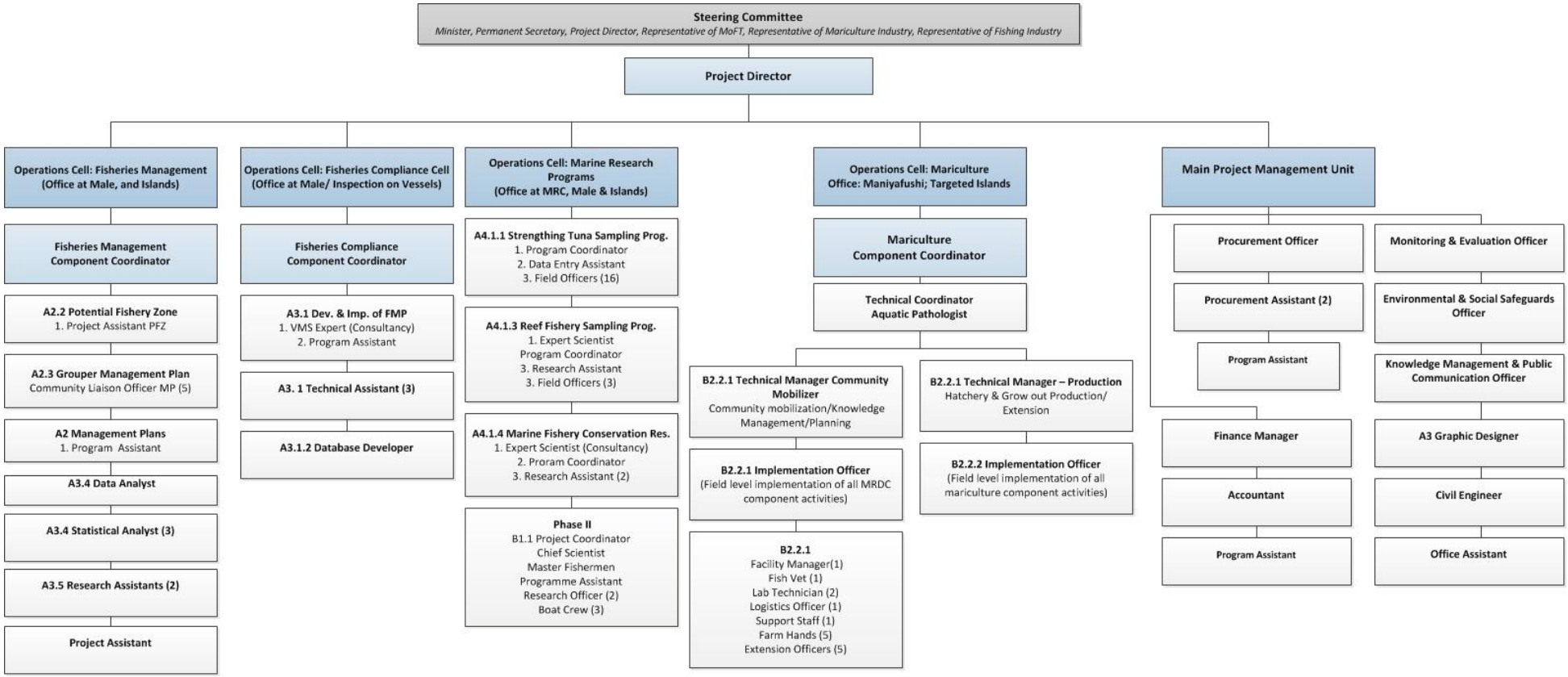


Figure A3.2: Organizational Structure of the PMU and its Operational Cells



6. The PMU has five cells (see Figure A3.2). The Main PMU will be based in Malé, and will constitute of staff specializing in: (i) financial management, budgeting and project accounting and reporting; (ii) procurement, and (iii) knowledge management, monitoring and evaluation.

7. The Operational Cell for Fisheries Management will be co-located with the Fisheries Management Division of MoFA at Malé, and Project Assistants, Community Liaison Officers and Research Assistants will be deputed to Island Council Offices for implementing the project activities as required. The Operational Cell for Fisheries Compliance will be working in Malé and in the field (including on vessels targeted under the VMS and electronic observation activities) as per implementation requirements. The Operational Cell on Marine Research will be co-located with the MRC, and will be involved in field-based surveys and research as is common practice at MRC. The Operational Cell on Mariculture will have two lines of staff: (i) staff who will be based at Maniyafushi to work on the MRDF; (ii) staff who will be working at the Quality Control and Disease Management and Quarantine facilities; and (iii) staff who will be headquartered at the site of the Multispecies hatchery; and (iv) staff who will be mostly based in the remote atolls for field level implementation of out-grower mariculture facilities. All relevant staff of the PMU Cell on Mariculture will visit the fields to provide extension services, as may be required.

Financial Management, Disbursements and Procurement

Financial Management

8. For this project the PMU established under the MoFA will manage all project expenditure. It shall be the only accounting center for the project. Expenditures will be centralized at the PMU and there would not be any funds transfers to any other entity/agency. The PMU will maintain a fully integrated voucher based computerized double entry accounting system incorporating Ledgers, Registers, Books, Cash-Based-Accounting and Reporting. The project accounting records would be maintained on cash basis where all the receipts/expenditure will be on cash basis of accounting. A financial management manual has been developed for the project which details the budgeting and fund flow process, applicable accounting policies and procedures for the project, staffing and auditing and reporting requirements.

9. The World Bank has finalized the financial management capacity assessment of the MoFA by reviewing the existing financial management arrangements. The initial capacity assessment indicates that the existing financial management capacity under MoFA are inadequate and a PMU will need to be established with adequate, qualified and experienced financial management staff to manage the project's financial management arrangements, thereby providing reasonable assurance that the funds will be used for the intended purposes. Hence, mainly due to the FM staff constraints financial management risk is rated substantial at this point in time. The finance manager once appointed at PMU will be the focal point for the Bank in all FM related matters.

10. **Budgets**: The Overall Work Plan and Cost Tables (both parts of the PIP), which has been agreed by GoM with the World Bank, contains year-wise breakup of physical targets, unit cost for each activity, financial targets for each activity under each component and the details of the components relevant for the project. The OWP shall form the basis of year-wise budget preparation for the year. The project will prepare annual work plan (AWP) based budgets. The budget shall be prepared through a consultative process. Each of the proposed divisions of PMU shall be a budget center and shall be responsible for budget preparation and shall be accountable / responsible for budgetary control system. The process followed would be that each budget center shall prepare its own budget and submit it to the Project Director for approval. Once approved, the budget section of the PMU shall consolidate the budget for the PMU as a whole. The consolidated budget shall be forwarded to the Steering committee for approval. The AWP will incorporate revisions based on variance analysis of the previous year.

11. Once the Steering Committee approves the AWP/Budget the approved AWP shall be submitted to the MOFT for inclusion in the Central Budget. In order that the exhaustive budgeting exercise gets completed within the specified time frame, a budgeting calendar has been prepared and agreed upon during project preparation and incorporated in the FM Manual.

12. **Accounting**: At present, MoFA, who is implementing this project, follows the Government Accounting System. This system is well documented in GoM's Financial Rules. At present Government Accounting currently is being carried out in SAP and because of its limitation (viz., no separate chart of accounts can be created, recording of expenditure is on accrual basis, etc.), the PMU will record and maintain project books of account in an off-the-shelf acceptable and well established accounting software like Quick Books which is quite well accepted in Maldives.

13. PMU shall be the only accounting center of the project. All the payment shall be made by the PMU. The project accounts shall be prepared by PMU. The project accounts will be maintained in double entry system of accounting and will follow the cash basis of accounting. All payments should be charged off to the relevant expense account head at the time of making the payment except in case of certain receivables and payables, to be specifically mentioned with reasons in the Notes on Accounts, which may be accounted for on accrual basis. For the purpose of accounting, the PMU will record and maintain project books of accounts in an off-the-shelf accounting software (QuickBooks). A Chart of Accounts (CoA) has been developed keeping in view the needs of the accounting system and World Bank Reporting requirement. The CoA has been designed in such a way that it facilitates reporting by Component, and Activity.

14. This project is 100 percent financed by the Bank. All project expenditure inclusive of taxes and duties, as applicable, has to be recorded at the actual USD expenditure at the date of the payment. The project entities will prepare quarterly interim unaudited financial reports (IUFRs) in the prescribed format which would be submitted to the Bank 45 days from the end of the quarter and will form the basis for disbursement by the Bank. The IUFRs will disclose receipt and utilization of project funds during the quarter, year to date and project to date. The IUFRs will be based on project accounts and will be reconciled with the project accounts.

15. **Internal audit.** The project will be subject to a regular internal audit by a firm of chartered accountants. The internal audit will assess whether funds have been disbursed on a timely basis, reached the intended recipients, and transactional controls and propriety have been maintained and used effectively and efficiently for the intended purposes. The internal audit reports will be shared with the Bank.

16. PMU shall form an Audit Committee to be headed by the Project Director to review the audit observations submitted by the Internal and External Auditors. The Audit Committee should meet at least once a quarter. The internal auditor shall also be invited for the meeting. The senior staff required in PMU will be drawn from MoFA, and by recruitment from market. The financial and accounting staffing requirement to be completed within three months of effectiveness, is given vide Table below.

Table A3.1: Accounting and Financial management Staff at PMU

Designation	Number of Positions
Division Chief: Finance Manager/Specialist	1
Accountant	1
Program Assistant (Finance)	1

17. **External Audit**: Financial statements of the project will be prepared by the PMU and will be audited annually by the Auditor General's Office of Maldives, which is acceptable to the Bank. This statutory audit report will provide the consolidated project financial statement along with audit observations. The audited financial statements together with the auditor's report along with the response from the project on the audit observation will be submitted to the Bank within six months of the end of the fiscal year. According

to Bank's Access to Information Policy, the audit report will be disclosed publicly on the Bank's website. The audit report will be monitored in the World Bank's Portfolio and Risk Management (PRIMA) System.

18. There is a need to strengthen the capacities of the existing FM staff especially in terms of operations of off-the-shelf accounting software (QuickBooks). The existing staff presently working in SAP have little or no exposure in using QuickBooks. All the staff will be trained on the off-the-self accounting software so that they have adequate capacities commensurate with the proposed scale of operations and flow of funds for the project.

19. **Supervision**: Supervision by the Bank team will involve desk reviews of internal, external audit reports and IUFR along with books of accounts and supporting vouchers and documents. Site visits will be planned as needed to review internal control procedures and practices. The focus during supervision will be on compliance, controls, and capacity building at all levels of project FM. Based on the risk, quarterly missions would be required in the first year of the project and the supervision can be reduced as the work progresses and the accounting systems are put in place and are providing the desired results.

20. **Adequacy of FM Arrangements**: The PMU will be responsible for implementing the above agreed FM arrangement for the project. A time-bound Action Plan has been agreed on with PMU to mitigate the perceived risks (refer FM action plan in Table A3.2 below).

Table A3.2: Financial Management Action Plan

N	Agreed Action	Time Frame
1	Finalization of audit ToR for both external and internal audit	Completed
2	Financial Management Manual	Completed
3	Fund flow arrangement with PMU confirmed	Completed
5	Opening of Designated Account at MMA	Within 2 weeks of effectiveness
6	Financial Management software to be operationalized in PMU	Within 3 months of effectiveness
7	Appointment of internal auditors.	Within 3 months of effectiveness
8	Appointment of Financial Management Specialist, qualified Accountant and other Financial Management staff	Within 3 months of effectiveness

Disbursements

21. **Fund Flow /disbursement process**: A DA in US dollars will be set up with the Maldives Monetary Authority, the Central Bank, to receive funds from the Bank. The Bank will advance an amount to the DA to meet the estimated expenditures for the first six months, as forecasted in the IUFRs. From this DA, payments will be made to suppliers, vendors, consultants and incremental operating costs. With respect to large international payments, the PMU will have the option of requesting the Bank to make direct payments to the supplier. Several agencies/institutions will be involved in planning, coordinating and implementing project activities. Financial management will however be centralized at the PMU and all payments will be made directly by the MoFT with the supporting documents provided by the PMU. It is agreed that no other entity will get involved in handling project funds and executing payments. The MOFT will provide a list of authorized signatories; therefore, the MoFT will have authorizing rights for requesting disbursements against grant proceeds from the Bank. All relevant documentation for such requests will come from the PMU to the MoFT.

22. The proposed project will be 100 percent financed by the Bank inclusive of taxes and duties. The following Table A3.3 specifies the categories of eligible expenditures to be financed out of the proceeds of the grant ("category"), the allocations of the amounts of the grant to each category, and the percentage of expenditures to be financed for eligible expenditures in each category.

23. **Retroactive financing.** The Government has requested the Bank to agree to a retroactive financing amount of up to US$3.6 million for eligible expenses prior to the effectiveness of the grant financing, and

paid after the date specified in the Grant Agreement. The expenditure must be backed by adequate documentation including evidence of payment and will have been procured according to principles and procedures described in the Procurement Manual and Financial Management Manual of the project.

Table A3.3: Category of Eligible Expenditures, Amount to Each Category, and the Percentage of Expenditures to be Financed

Category	Amount of the Grant Allocated (expressed in US$)	Percentage of Expenditures to be Financed (inclusive of taxes)
Goods, works, non-consulting services, consulting services, training and workshops, and incremental operating costs for Parts A, B and C of the Project	18,000,000	100.0%
TOTAL AMOUNT	**18,000,000**	100.0%

Procurement

24. Procurement of all works, goods, non-consulting services and consultancy services under the project would be carried out in accordance with the World Bank's New Procurement Framework and Regulations for Projects After July 1, 2016 issued on 28th June 2016 (hereafter referred to as the "Regulations"), and the provisions stipulated in the Legal Agreement. For procurement under the project, the MoFA has developed a Procurement Manual conforming to the Regulations, and this Manual is acceptable to the Bank. In case of any inconsistency between the Procurement Manual and the Regulations, the latter shall prevail.

25. MoFA has also developed a Project Procurement Strategy for Development (PPSD) acceptable to the Bank. A description of the major works, goods and consulting services to be procured under the project is described in Procurement Plan for the project, available at the project's database, and which will also be published in the Bank's external website as well as the website of MoFA. For each contract to be financed by the Bank, the different procurement methods or consultant selection methods, the need for pre-qualification, estimated costs, prior review requirements, and time frame agreed on between the Recipient and the Bank are reflected in this Procurement Plan.

26. **Procurement of Works**: Major works to be procured under this project would include the multispecies hatchery, and buildings of the MRDF. Based on the PPSD, a design, build, operate and transfer (DBOT) contract will be used for the multispecies hatchery. The market approach for procurement will be open, international, single-stage, two envelop bids with Best and Final Offer (BAFO) or negotiation, using Bank's "Standard Procurement Document suitably modified and agreed with the Bank. Building MRDF would be procured using Request for Bids selection method; and based on the PPSD, the market approach for such packages will use the option of open, national, single-stage, single envelope bidding process. For procurements under national competition, bidding documents based on the Bank's standard bid documents (SBD) suitably modified and agreed with the Bank will be used.

27. **Procurement of Goods**: Major goods and equipment to be procured under this project will include the VMS, electronic observer system (EO), a variety of laboratory equipment, fish feed, small boats, generators, office equipment, computers, and furniture. The VMS and the EO are sophisticated, high value and shall be procured using international competitive bidding (ICB) procedures. Other goods/equipment will be procured using Request for Bids or Request for Quotations methods based on the thresholds values. Based on the PPSD, the market approach for Request for Bids would use the option of open, national, single-stage, single envelope bidding method. For all procurements under National Competition, bidding documents based on the Bank's SBD suitably modified and agreed with the Bank will be used.

28. Rates contract of Government with State owned or controlled company (e.g., the State Trading Organization), if any, could be treated as one of the three quotations in the shopping process; but no procurement will be made from such Government-owned or controlled companies.

29. **Selection of Consultants:** The major consultancies would include the deep-sea exploration, monitoring and evaluation consultancy, specialized scientific studies, external auditors, gender studies, market studies, and a number of individual consultancies. Short lists of consultant firms for services estimated to cost less than $200,000 or equivalent per contract may comprise entirely of national consultants (however, given the low capacity of consulting industry in Maldives, such predominance of national consultants is unlikely).

30. **Training**: Training will cover overseas long and short-term studies, overseas and in-country study tours, workshops, etc. These will be carried out in accordance with staff development plans prepared by the PMU and agreed with the Bank.

31. **Operating Cost**: The project will support project implementation costs and such other project implementation related costs of recurring nature which will include costs of incremental staff hired on contract; incremental and operating costs for hiring of vehicles and boats; rent for incremental office spaces; advertisements; purchase of consumables, consumable chemicals and reagents; repairs of equipment, provided such expenditures are incurred following procedures as per the project's procurement manual.

32. **Direct Contracting**: The project will finance procurement stand-alone software packages, books and periodicals, etc., which are proprietary in nature, and would be procured using direct contracting method.

33. **Non-Consulting Services**: PMU will hire boats for facilitating research activities, as an example, and these will be procured using a bidding document for non-consulting services agreed with the Bank.

34. **Ineligible expenditures**: There is no expenditure included in the project's cost estimates, which does not fulfill eligibility conditions of Procurement/Consultant Guidelines. During implementation if such requirements arise, these will be financed from the Governments' own resources. Additionally, if any contract is cancelled during implementation of the contract and thereafter the reminder of the works/supply/services is procured deviating from methods specified in the Procurement Manual (and potentially selecting state-owned companies), any expenditure for the remainder of such contract will be deemed ineligible, unless agreed with the Bank with sufficient notice prior to cancellation of the contracts.

35. **Systematic Tracking of Exchanges in Procurement (STEP).** The project will implement STEP, a World Bank planning and tracking system, which would provide data on procurement activities, and establish benchmarks. The details of the procurement activities, presently described in the Procurement Plan would be transferred in the STEP within a month of effectiveness of the project. The Bank team will provide initial training on the operation of the STEP system to the PMU staff.

36. **Country Procurement Assessment**: Procurement capacity assessment studies for various entities, and procurement post reviews of projects in Maldives have pointed out issues such as: (a) inadequate procurement capacities; (b) inadequate capacity of national contractors or goods suppliers that in some cases hinders designing appropriate qualification requirements as per Bank's SBDs for goods and works; (c) insufficient experience in contract administration; (d) poor implementation of public disclosure of procurement actions; (e) inherent weaknesses in transparency and fairness of procurement processes; (f) delays in finalization of annual procurement plans; (g) ambiguous and incomplete specifications for equipment; (h) delays in procurement decisions. The above findings are all potentially applicable for the current project.

37. **Assessment of the MoFA/PMU capacity to undertake procurement activities:** The project has one implementing agency- MoFA through its PMU. The MoFA has the sole mandate and experience in fisheries

in the country and has been the obvious choice to lead project implementation. MoFA has set up a unit in the form of PMU, to exclusively lead and achieve the PDOs; coordinate project activities on a full-time basis and directly implement most of the project's procurements. The MoFA has implemented or participated in implementation of Bank-financed projects, but not in the recent past. MoFA follows the provisions contained in the Public Financial Regulations, 2015. The PMU will be fully responsible for the entire procurement cycle from preparation of bid documents to invitation to signing of contract, except that for the high-value contracts (exceeding contract value of US$166,000 (equivalent to MVR2.5 million), the following will apply:

(a) Technical specification and bid document will be finalized by PMU;
(b) Procurement process from RFB/RFP to selection will be done by the National Tender and Projects Monitoring (NTPM) of the MoFT;
(c) Approval will be accorded by the National Tender Board;
Note: for these high-value contracts, the NTPM of the MoFT will be responsible for maintaining all the documents in their original and physical copies; public disclosure as applicable, and for redressing any grievance.
(d) PMU will sign the contract in their role as employer.

38. PMU will also oversee contract management under the project. The PMU will ensure timely procurement as per the Procurement Plan prepared by the Project, or as per the Annual Action Plan.

39. The Bank's task team has carried out an assessment of the capacity of MoFA to implement the procurement arrangements, and this has included: (i) a review of the organizational structure for implementing the project, and (ii) interaction with the concerned staff of MoFA. Although the PMU has the required level of delegation of powers and a streamlined approval process, it has been established only recently, and therefore, draws some of its resources from MoFA. MoFA has procurement staff who do not have experience of handling Bank financed projects, and are not fully aware of the Bank's procurement procedures and guidelines. Therefore, a specifically selected procurement specialist/officer (with requisite qualifications and experience) will support PMU procurement cell, who are responsible for procurement of goods, works and consulting services for the project. Such a procurement specialist will be hired within 3 months from effectiveness. Based on the above, and the actions proposed by MoFA, it is assessed that the PMU will have appropriate procurement capacity to handle the intended procurement activities.

40. **Procurement Risks and Procurement strategy:** The main procurement risks that can be perceived at this stage, based on the review of general public financial management in the country and the assessment carried out, include: (i) procurement of goods, works and consulting services has usually involved fiduciary risks related to transparency and fairness; (ii)) low capacity in developing correct and appropriate specifications, identifying right market, inability to influence the market in receiving appropriate pricing and delivery of commitments; (iii) inadequate record keeping; (iv) absence of an operating grievance/complaint monitoring system; (v) lack of appropriate dispute resolution procedures and lack of established system of public disclosure of information on procurement actions; (vi), potential rent-seeking in procurement of goods; (vii) deficiencies in planning, monitoring, evaluation and reporting; (viii) collusive practices in procurement of works; (ix) inadequate capacity of national consultants/contractors/goods suppliers that in some cases hinders designing appropriate qualification requirements as per Bank's SBDs for Goods and Works. Further, the PMU in the project is newly formed and is not expected to have comprehensive experience or capacity in implementing procurement activities. The above and the other applicable deficiencies have been addressed by the following procurement strategy:

Table A3.4: Procurement Strategy

Risk Factor	Initial Risk	Procurement strategy to Mitigate the Risks	Residual Risk
Record keeping and documentation	High	• The project has prepared a procurement manual addressing these issues.	Moderate

Risk Factor	Initial Risk	Procurement strategy to Mitigate the Risks	Residual Risk
		• At the beginning of the project a brief overview of the documents to be maintained and filed would be discussed with the procurement and senior staff of PMU. • Subsequently during project implementation, the record keeping and documentation regarding procurement shall be monitored. • Implementing STEP will help record-keeping.	
Inadequate understanding of procurement procedures	High	• A procurement specialist will be hired at the PMU who will be well aware of the public (World Bank) procurement guidelines and procedures. • The procurement manager, support staff, division chiefs and the relevant officers of MoFA will receive appropriate training for implementing procurement under World Bank assisted projects. • Bank team will help the recipients and the PMU with hands-on expanded implementation support (due to usual capacity constraint in a small island country)	Moderate
Inefficiencies and delays in procurement process	High	• Timeline to finalize the tenders/selections has been specified in the Procurement Manual and the Procurement Plan. • Creation of PMU so that there are no delays in decision making. • Use of an experienced Procurement Specialist in the PMU.	Moderate
Insufficient competition in procurement	High	• Development of webpage for the Project in the MoFA website; and publishing all tenders (NCB/ICB and shopping) in the procurement section of the webpage. • For RFQ, invitations for quotations will be advertised in at least one widely circulated national daily newspaper or the national gazette to increase the reach. • In RFQ, a minimum of three sealed quotations will be obtained and must be opened in public at one location immediately after the deadline for the submission. In case three quotations are not received, the quotations shall not be opened; and the quotations must be called for again (in addition to advertising in the MoFA website). In the event that, even after this repeated attempt, three valid quotations are not available, prior approval from Bank may be obtained to carry on the evaluation process with less than three quotations. • Publishing the General Procurement Notice close to project launch in the regional and national newspapers. • Publishing all Specific Procurement Notice in the project website in addition to a national newspaper. • Building-up the cost database. • Publishing the Procurement Plan, and specifications of equipment in the webpage early. • Disclosure of all contract awards in the project webpage. • Publishing list of purchase orders/ contracts placed using shopping procedure every month in the projects webpage.	Moderate

Risk Factor	Initial Risk	Procurement strategy to Mitigate the Risks	Residual Risk
Inadequate capacity of national contractors/ goods suppliers that hinders designing appropriate qualification requirements as per Bank's SBDs for Goods and Works	High	**For "Request for Bids" – Open, National** • Allowing Joint Ventures in bid documents • Reasonable qualification criteria shall be stated in the bidding documents, and if a registration process is required, a foreign firm declared as the lowest evaluated responsive bidder shall be given a reasonable time for registering, without let or hindrance; • Bidders will be allowed to bid in MVR and/or USD. **For "Request for Quotations"** • Bidders allowed to bid in MVR and /or USD so that the foreign companies have the option to bid. • These will allow and encourage the international companies to bid in USD, or as the case may be, as partners in Joint Ventures.	Substantial
Contract management	High	• Pre-dispatch and post-dispatch inspections will be undertaken. • A detailed quarterly report of all the ongoing contracts, including status of contract management issues such as delays, payments, etc., will be submitted by the Procurement Cell to the Project Director for review (also submitted to the Steering Committee and the Bank).	Substantial
Fraud and corruption risks (including collusion and outside interference) in contracting process	High	• Measures to improve competition includes preparation of broad technical specifications, realistic post qualification criteria, and, appropriate contract packaging. • Better disclosure, complaint handling, MIS, documentation. • Training provided to the PMU staff in detecting fraud and corruption indicators by hiring a consultant with requisite skills.	Substantial
Weak complaint redress mechanism	High	• A complaint handling mechanism has been specified in the Bank Regulations will be followed, and is already part of the Procurement Manual. • A six-monthly report of all complaints received and action taken will be submitted to the Project Director for review (also submitted to the Steering committee and the Bank). This report will also be published in the project webpage by the Project Director.	Moderate
Corruption in procurement	High	• Disclosure of contract opportunities, contract award decisions, internal/external procurement and financial audits.	Substantial
Overall Risk	**High**		**Substantial**

41. As a departure from general norm, invitations for bids for NCB for works and goods instead of being advertised in at least one widely circulated national daily newspaper may also be advertised in the national gazette. In view of limited capacity and decentralized nature of project implementation (where contracts will be actually managed at remote atolls, even if procured at the PMU), the overall residual risk for procurement will still be 'Substantial'.

42. **Disclosure**: The following documents shall be disclosed on the MoFA's website [i.e., in the Project Webpage]: (i) Procurement Plan and updates, (ii) specification for goods and equipment as soon as these are prepared, (iii) invitation for bids for goods and works for all national and international competitive

methods as well as in all RFQ method, (iv) request for expression of interest for selection/hiring of consulting services, (iv) contract awards of goods and works procured, (v) list of contracts/purchase orders placed by PMU using shopping procedure on a quarterly basis, (vi) short list of consultants, (vii) contract award of all consultancy services including individual consultants, (viii) list of contracts following DC or CQS or SSS on a quarterly basis, and (ix) action taken report on the complaints received on a half yearly basis.

43. The following details shall be sent to the Bank for publishing in the UNDB: (a) invitation for bids for procurement of goods and works using ICB procedures, (b) request for expression of interest for consulting services with estimated cost more than $200,000, (c) contract award details of all procurement of goods and works using ICB procedure, (d) contract award details of all consultancy services with estimated cost more than $200,000, and (e) list of contracts/purchase orders placed following SSS or CQS or DC procedures on a quarterly basis.

44. **Agreed Procurement Arrangements**: The MoFA has prepared a Procurement Plan for project implementation which provides the basis for the procurement methods. This plan has been agreed between the Recipient and the Bank's task team at appraisal, and is available at the office of the PMU, webpage of the MoFA, and in the project files. It will also be available in the project's database, and in the Bank's external website. For each major contract to be financed by the Bank, the different procurement methods or consultant selection methods, the need for prequalification, estimated costs, prior review requirements, and timeframe are specified in the agreed Procurement Plan. The Procurement Plan will be updated in agreement with the Bank's task team annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

45. Procurement skills: All procurement will be carried out by the PMU. A Procurement Manager in the PMU will manage all the procurement in the project and may be assisted by a Procurement Specialist (who will have experience in procurement in projects financed by international agencies), and other relatively junior procurement staff. The procurement manager and the procurement support staff will receive appropriate training for implementing procurement activities using Bank's procurement guidelines. In addition, all Division Chiefs of the PMU and the relevant officers of MoFA will also receive procurement training facilitated by the World Bank. This training program will include modules to improve the skills on procurement and contract administration.

46. Standard Procurement Documents (SPDs): The SPDs to be used are described below.

(a) Works: For the multispecies hatchery (through a DBFO contract) will be procured using Request for Bids using the "Standard Procurement Document" for request for proposals, with changes as necessary agreed with Bank' team. For other works contracts, the Request for Bids will specify (i) open, international, single-stage, two-envelops method using BAFO or negotiations, or (ii) open, national, single-stage, single envelop method, as the case may be and as detailed in the Procurement Plan. For international competition, a "Standard Procurement Document" with minimum changes acceptable to the Bank as necessary to address specific conditions, in accordance with World Bank guidelines, shall be used. For all procurement under national competition bidding, "Standard Procurement Document" for Request for Bids shall be prepared and agreed with the Bank. For works contracts below the threshold level (see Table A3.5), Request for Quotation selection method shall be used. The RFQ document shall be agreed with the Bank before initiating the process.

(b) Goods: Request for Bids selection method will be used and market approach for the packages could be either of the following options as detailed in the procurement plan: (i) open, international, single-stage, two-envelops method using BAFO or negotiations, or (ii) open, national, single-stage, single envelop method, as the case may be and as detailed in the Procurement Plan. For international competition, a "Standard Procurement Document" with minimum changes acceptable to the Bank as necessary to address specific conditions, in accordance with World Bank guidelines, shall be used. For all procurement under national

competition bidding, "Standard Procurement Document" for Request for Bids One-Envelop shall be prepared and agreed with the Bank. For supply and installation contracts, below the threshold level (see Table A3.5), Request for Quotation selection method shall be used. The RFQ document shall be agreed with the bank before initiating the process

(c) Services: For all procurement of Consultancy Services, the Bank's latest Standard Request for Proposal as agreed with the Bank will be used.

47. Methods of procurement: The following methods of procurement (see Table A3.5) shall be used for procurement under the project.

Table A3.5: Procurement Methods to be used in the Project

Expenditure Category	Contract Value (Threshold[22])	Procurement Method	Contracts/Processes subject to Prior Review
Goods	>= US$100, 000	Open, International	All contracts over US$2 million
	< US$100,000	Open, National	All contracts subject to post review
	<= US$25,000	Quotation	All contracts subject to post review
	No Threshold	Direct Contracting	All contracts
Works	>= US$1,000,000	Open, International	All contracts over US$10 million
	< US$1,000,000	Open, National	All contracts subject to post review
	<= US$50,000	Quotation	All contracts subject to post review
	No threshold	Direct Contracting	All contracts
Consulting Services (firms)	>= US$300,000	All competitive methods [advertise internationally) except CQs	All contracts above US$1 million
	< US$300,000	All competitive methods [advertise locally) except CQS	All contracts above US$200,000
	< US$200,000	Selection based on Consultants' Qualifications (CQS)	All contracts subject to post review
	-	Direct Selection (DS)	All contracts
Individual consultancies	-	Competitive	All contracts over US$300,000
		Direct Selection (DS)	All contracts

48. Prior review by the Bank for works and goods: Under this would be included: (i) the first open international contracts for either works or goods, and subsequent contracts above US$10 million for works and US$2 million and above for goods; (ii) the first open national contract of works and goods; and (iii) all contracts awarded on direct contracting method will be subject to prior review by the Bank. It is agreed that one sample bidding document will be approved by the Bank for each type of package and the bidding documents, and all subsequent bidding documents including those under post-review, will be prepared according to this approved sample. The clauses that may need modifications, in each case, will also be agreed with the Bank.

49. Prior review by the Bank for consultancy services: This would include: (i) the first contract of any value, and subsequent contracts valued over US$200,000 equivalent for firms selected through a national competition, and above US$300,000 for individuals selected through competitive methods; and (ii) all contracts to be awarded on direct selection basis irrespective of value will be subject to prior review by the Bank.

[22] Note that if a particular invitation for bid comprises of several packages, lots or slices, and invited in the same invitation for bid, then the aggregate value of the whole package determines the applicable threshold amount for procurement and also for the review by the World Bank.

50. Post Review by the Bank: All contracts not covered under prior review will be subject to post review during supervision missions, and/or review by consultants to be appointed by the by Bank. The normal Bank requirement of procurement post review of 15 percent of the contracts for a project with a risk rating of 'Substantial' will be followed. In addition, whenever contracts are terminated without prior consent of the World Bank, all contracts needed to complete the activities originally included in such terminated contract(s) will be subject to post-review.

51. Procurement Review by MoFA: Independent review or audit will be undertaken for the project for MoFA's own internal due diligence, and as described in the Financial Management Manual for the project. A part of the activities of the internal/external auditors will include carrying out post review of the contracts awarded by the PMU. The report submitted by the internal auditors will be part of the quarterly progress reports. In the event, the external auditor includes any procurement related observation in the audit report, the same shall be shared with Bank along with the comments of PMU.

52. Frequency of procurement supervision: Given the constraints and the risk involved a minimum of four supervision missions a year is planned. In addition to supervisions missions, the Bank will also carry out an annual ex-post review of procurement that falls below the prior review threshold.

53. Summary of the PPSD: The following Table A3.6 describes procurement arrangements for key activities.

Table A3.6: Procurement Strategy and Arrangements for Key Activities

Contract Title, Description and Category	**Estimated Cost (US$) and Risk Rating**	**Bank Oversight**	**Procurement Approach/ Competition:** • National/ International • Open/ Limited • Competitive/ Direct Contracting • QCBS/QBS, etc. • Negotiation and BAFO	**Evaluation Method** • Related Criteria • Lowest Evaluated Cost
Contract for multispecies hatchery.	5.6 million / High	First package: prior review	Open, International approach, "Request for Bids" (single stage/two envelopes)-DBOT contract with BAFO /Negotiations	Lowest Evaluated Cost
Facilities for MRDF	1.8 million / Moderate	First Package: Prior review	Open, National approach, "Request for Bids" (single stage/single envelope)-DBO type contract	Lowest Evaluated Cost
Procurement of VMS, Electronic Observer Systems	1.71 million / Moderate	First Package: Prior review	Open, International approach, "Request for Bids" (single stage/two envelopes), traditional types of goods contracts with BAFO/Negotiations	Lowest Evaluated Cost
Building for Quarantine Facility	1.71 million	First Package-Prior review	Open, National approach, "Request for Bids" (single stage/single envelopes)- traditional type of works contract type	Lowest Evaluated Cost
Cages for mariculture farms	0.14 million	First Package: Prior review	Open, International approach, "Request for Bids" (single stage/single envelope). traditional type goods contract	Lowest Evaluated Cost

Environmental and Social (including safeguards)

54. The Maldives consists of 1,192 coral islands grouped in a double chain of 26 atolls. The country's atolls encompass a territory spread over roughly 90,000 km^2, making it one of the world's most geographically dispersed countries. Of these 1,192 islands, 188 are inhabited by the country's population, with an average of 5-10 islands in each atoll being inhabited islands that have infrastructure such as housing, roads and other facilities. The country's total land area is estimated to be approximately 300km^2, with islands varying in size from 0.5 km^2 to 5.0 km^2. A significant number of uninhabited islands in each atoll have also been converted to resorts and tourism facilities as well as house infrastructure such as industrial facilities and airports.

55. The atolls are composed of live coral reefs and sand bars, situated atop a submerged ridge 960km long that rises abruptly from the depths of the Indian Ocean. Maldives is noted as the country placed at the lowest elevation in the world, with maximum and average natural ground levels of only 2.4m and 1.5m above sea level, respectively. More than 80 percent of the country's land is composed of coral islands which rise less than one meter above sea level. The islands consist of coral, sea grass, seaweed, mangrove and sand dune ecosystems which are of great ecological and socio-economic significance. Maldives is home to a number ecologically sensitive marine habitats in shallow and intertidal zones which have been designated as protected areas by the Ministry of Environment and Energy (MoEE) and these regions and all activities in their vicinity are stringently monitored and managed.

56. Climatic conditions in the Maldives belong to the tropical-monsoon category with temperatures ranging between 24°C and 33°C throughout the year. Climatic conditions in the Maldives is predominantly affected by the large landmass of South Asia situated to the north. The presence of this landmass causes differential heating of land and water. These factors set off a rush of moisture-rich air from the Indian Ocean over South Asia, resulting in the southwest monsoon. Two seasons dominate Maldives' weather: the dry season associated with the northeastern monsoon and the rainy season which brings strong winds and storms. The shift from the dry northeast monsoon to the moist southwest monsoon occurs during April and May and the southwest monsoon in the beginning of June and lasts until the end of August. Annual rainfall averages 2540mm in the north and 3810mm in the south, with the southern region experiencing more rain.

57. The project focuses on the whole country. The island of Maniyafushi where the project will finance the augmentation of the infrastructure of the MRDF, is an uninhabited island located in South Malé Atoll, where the physical infrastructure has already been set up. The establishment and subsequent operation of the multispecies hatchery and mariculture out-grower farms will be in the remote atolls, selected specifically to avoid any potential impacts on corals and water quality.

58. While the project is classified as environmental category B, the project is expected to bring positive environmental benefits to the project areas as the entire design of the project is based on the need to conserve the marine resources, avoid and stop unsustainable capture and yields, comply with the best regional and international standards, and diversify into mariculture as an alternative to threatened reef fisheries. The project will not lead to potential large scale significant and/or irreversible impact as the impacts will be largely localized to project sites and can be managed via stringent due diligence and adherence to national and international sectoral standards. Specific standalone environmental impact assessments and subsequent permits from the MoEE will be needed for the (i) multispecies hatchery; (ii) augmentation of the infrastructure of the MRDF; and (iii) out-grower farms for mariculture and it is through these assessments that site specific impacts will be identified.

59. The project will support the establishment infrastructure such as training and research centers and laboratories as well as infrastructure to conduct mariculture activities which will include civil works in setting up the necessary infrastructure for the center as well as the establishment of infrastructure on the ocean, such as fish cages and/or pens. These will lead to localized environmental impacts typical to civil

works, such as the need of construction material, generation of dust, noise etc. and occupational and safety impacts that need to be managed accordingly.

60. The establishment of out-grower farms for mariculture development, where the project aims to finance start-up investments for mariculture production (for example, cage cultivation of native fish species and operations at the multi species hatchery and MRDF) will also pose potential operational impacts. During mariculture operations typical environmental impacts include eutrophication from feeds and effluents, release of antifouling chemicals and antibiotics, and impacts from introduction of alien invasive species. The project, in line with Maldivian environmental regulations will only facilitate mariculture activities with native and/or naturalized species. Other impacts include the scenario of fish escaping from farms which may then compete with wild stocks. In addition, the transfer of parasites and diseases and genetic interaction between escaped farmed fish and wild stocks is a concern. However such impacts are mostly site-specific; regulation and control will therefore always need to be focused on a case-by-case approach. Thus individual environmental assessments will be undertaken for all project activities and stringent measures for mitigating and managing operational impacts have been included both within the project modality and safeguards mechanisms.

61. Mariculture is not entirely new to the Maldives. In the last decade a few projects have been initiated and have undergone environmental assessments where site specific impacts have been noted to be manageable via environmental controls being established from the very onset of the project.

62. An ESMF, in lieu of an overall project-specific Environmental and Social Assessment (ESIA), has been prepared as details of specific sites and design of the project's physical interventions are not known. A standalone ESIA has already been prepared for the aquatic animal quarantine facility, which is a front runner intervention and has been disclosed as part of the ESMF. The ESMF outlines detailed guidelines of measures for environmental and social risk mitigation and institutional arrangements for conducting environmental and social assessment, instruction to the preparation of Environmental and Social Assessments (ESIAs), Environmental and Social Management Plans (ESMPs), and other such measures as well as implementation and monitoring.

63. All interventions will be subject to an environmental screening with the objective to: (a) determine the anticipated environmental impacts, risks and opportunities of sub-project; and (ii) determine if the anticipated impacts and public concern warrant further environmental analysis, and if so to recommend the appropriate type and extent of Environmental Assessment needed as per the set criteria in the ESMF.

64. The ESMF has taken the applicable safeguard policies into account as well as the national environmental requirements and World Bank environmental Health and Safety Guidelines. These will serve as a guide to the level of environmental analysis and mitigation required for all interventions supported by the project which have the potential to trigger negative environmental impacts and thereby ensure compliance with the World Bank's environmental safeguard policies and the relevant national Environmental regulations during implementation. As a category B project, all physical activities financed under the project in general will be subject to environmental screening and preparation of an environmental management plan at minimum. All physical sub-projects/activities will prepare ESMPs that will describe and prioritizes the actions needed to implement mitigation measures, corrective actions and monitoring measures necessary to manage the impacts and risks identified in the screening assessments. Measures and actions that address identified impacts and risks will favor the avoidance and prevention of impacts over minimization and mitigation wherever technically and financially feasible. Where risks and impacts cannot be avoided or prevented, mitigation measures and actions will be identified so that the activities operates in compliance with applicable national laws and regulations etc., and meet the requirements of relevant World Bank EHS standards.

65. The implementing agency of the project will be the MoFA. The MoFA while having been involved in contributing in World Bank financed projects has not led such an operation in the recent years. Due to this capacity within MoFA to manage and implement Bank safeguards within a project setting will be limited.

As per the proposed implementation structure, a PMU, housed within the ministry will be established. This PMU structure will have to include staff designated to focus on safeguards requirements and implementation and thus will hire an Environmental and Social Safeguards Coordinator with relevant technical sectoral expertise. S/he will report to the Project Director and will work closely with the assigned team, the Ministry of Environment and Energy, Island Councils, Environmental Protection Agency etc. The Environment and Social Coordinator will be responsible for ensuring the overall implementation of the ESMF and will also liaise with other agencies, contractors and engineering supervisors at the subproject level to implement safeguards mitigation measures. The Environment and Social Coordinator will be responsible for monitoring and evaluation of safeguards implementation and will report on compliance and status of performance indicators. S/he will travel to the atolls and will be responsible for covering the project sites and will work closely with the consultants, contractors and staff at the sites and report to the Project Director. The Island Council and the Atoll Council will be the first level of contact for any grievance/feedback for the community. The Environment and Social Coordinator will take the lead to orient staff and implementing partners of the ESMF and on how best to operationalize it on the ground.

66. The project will provide training in environmental and social management to improve institutional capacity. The cost for monitoring and supervising the implementation of the ESMF has been integrated into the overall project investment cost. In addition the project will also provide capacity building to potential operators of out-grower farms on maintaining a good mariculture environment, and mitigating and managing potential environmental impacts during the operation.

Monitoring & Evaluation

67. The existing statistical systems about fisheries in Maldives are fragmented, do not cover aspects such as reef fisheries or recreational fishery, and are of varying quality. This is largely due to weak human capacity and lack of investment in maintaining the dedicated data collection systems, software and human resources required. Baselines for this project have been established using the best available, but not a complete set of desirable information. These include information generated by FAO and World Bank studies, studies undertaken as part of the JICA-financed Fisheries Sector Roadmap, and the MEDeP. One of the important project activities will be strengthening the statistical information system (in collaboration with the National Statistical Bureau). As the statistical information system is strengthened, the benefits of adding additional modules to enable the system itself could provide regular monitoring information, is self-evident.

68. Monitoring and evaluation of outcomes and results are a core part of the project design. The PMU and the MoFA Divisions will collect and present data and reports for six-monthly reviews by the MoFA Steering Committee in conjunction with World Bank implementation support missions. Discussions during these missions will relate to institutional capacity building, financial viability and technical reviews. Site visits will also provide effective means of monitoring progress.

69. Each cell of the PMU will be responsible for monitoring and reporting. This will be consolidated by the Monitoring and Evaluation Officer, who will also verify monitoring reports from each cell of the PMU, and cross-reference these reports against the project's outcome indicators. All monitoring data will be centralized at the MoFA Policy and Coordination Division, and will be available to the National Statistical Bureau, and all interested stakeholders (such as the other countries of SWIO region).

70. The project will undertake two independent evaluations, through selected independent expert consultants: one prior to the mid-term review of the project, and another six months prior to closing of the project. These evaluations will be augmented by annual opinion surveys of beneficiaries of the project.

Annex 4: Implementation Support Plan

MALDIVES: Sustainable Fisheries Development Project
(Fourth South West Indian Ocean Fisheries Governance and Shared Growth Project)

Strategy and Approach for Implementation Support

1. The strategy for implementation support aims to make implementation support to the client flexible and efficient and focuses mainly on implementation of the risk mitigation measures. The World Bank's approach to implementation support emphasizes open and regular communication with all actors directly involved in the project, constant information exchange, and adequate flexibility to accommodate the specificities of the project. These aspects will remain crucial for the project during its implementation.

2. The implementation support strategy is based on mechanisms that will enable appropriate implementation support to the government and timely and effective monitoring. These mechanisms are: (a) joint review missions; (b) regular technical meetings and visits by the World Bank, between the formal joint review missions; (c) the PMU reporting based on the performance agreements, and regular monitoring against the results framework; and (d) internal audit and FM reporting.

3. Implementation support in the first year will focus on: (a) completion of procurement of key contracts, such as the multispecies hatchery; (b) setting up systems for project monitoring including project reporting templates, monitoring and evaluation formats, setting up the project fund flow processes, and financial management reporting templates; and (c) getting PMU staff trained on the Bank's procurement, financial management and safeguards systems and policies.

4. The project has significant procurement, technical and engineering aspects, and therefore at least 14-18 weeks of procurement staff will need to be dedicated to the supervision of the Project, as well as 4-8 weeks of: a mariculture specialist; a regional fishery management and information systems specialist; an expert on vessel monitoring systems; a social development specialist with specialization on community mobilization and preferably on gender issues; and a regional environmental planner. Support from the Climate Change, Finance and Markets, and Jobs GP/CCSA teams, Trade Facilitation staff, and gender specialists will also be required during all years of project implementation.

Implementation Support Plan

5. The various activities needed for implementation support would require the following resources:

Main Focus

Time	Focus	Skills Needed
First 12 months	Completion of procurement for key contracts including review of terms of reference and designs, and initiation of selected works and studies; Setting up FM and disbursement systems; Development of project management and M&E manuals and systems	TTL(s)/Project Management Procurement FM/Accounting Mariculture Expert (with specialization on hatchery) Fishery sector monitoring and surveillance Vessel Monitoring Systems, Electronic Observations Environmental Specialist Social Specialist (specialization in Community Mobilization and Small Businesses) Expert on Gender Issues Expert on Fisheries Statistics, web-applications, M&E Civil construction specialist

Time	Focus	Skills Needed
12–84 months	Procurement of contracts for components identified for later phases; Review and finalization of designs; Initiation of selected works and studies including out-grower mariculture farms; Contract Management; Project Management; Monitoring and evaluation; Environmental Monitoring; Preparing long-term plans for the fisheries sector and related value-chains	In addition to all of the above skills in Year 1, technical skills in the following areas: Fisheries policy and regulations Fisheries institutional development (including coordination for regional cooperation) Establishment and operation of small-scale mariculture out-grower farms Zoning of seascape Communications

Skill Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
TTL/Co-TTL/ Project Management	14 weeks per year	4 trips per year	Full-time including technical visits.
Procurement	14 weeks per year (18 weeks in Year 1)	4 trips per year	Half-time of local consultant (4 trips in Year 1); 25 percent of staff time.
Financial Management	4 weeks per year	2 trips per year	Providing support in financial management due diligence of the project.
Environmental Safeguards	4 weeks per year	2 trips per year	Monitoring environmental due diligence and compliance.
Regional/Environmental Planner	4 weeks per year	2 trips per year	Facilitate zoning of the EEZ. Could double up as Marine Conservation Specialist.
Marine Conservation Specialist	4 weeks per year	2 trips per year	Support preparation of action plan, protocols and monitoring systems for improved management of the marine protected areas.
Mariculture Expert (Hatchery)	4 weeks per year (8 weeks in Year 1)	2 trips per year	Supporting finalization of specifications; supporting installation, and operation.
Mariculture (Out-grower Farms)	6 weeks per year	3 trips per year	Supporting finalization of specifications; supporting installation, and operation.
Fishery Specialist (Monitoring, Control and Surveillance)	4 weeks per year (6 weeks in Year 1)	2 trips per year	Supporting finalization of specifications; supporting installation, and operation.
Expert on VMS, eObservation	2 weeks in Year 1	1 trip in Year 1	Supporting selection of best technology.
Expert on Fisheries Statistics, web-applications and M&E	4 weeks per year (8 weeks in Year 1)	2 trips per year	Support designing and installation of improved fisheries management system; improved monitoring and reporting; provide guidance on citizen's engagement, and beneficiary surveys.

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Fisheries Policy and Regulations Expert	4 weeks per year	2 trips per year	Provide support and facilitate dialogue with SWIOFC and SWIOFish projects (including Maputo Sub-Regional Center), and with IOTC; support expansion of fisheries policies to cover mariculture and deep-sea fisheries, and related value-chains.
Social Development Specialist (Community Mobilization and Business Planning)	6 weeks per year	2 trips per year	Supporting organization of the atoll communities, councils, and working with the household-level out-grower farms to convert them into successful business ventures.
Gender Specialist	2 weeks per year	1 trip per year	To mainstream gender considerations into the project, including enhancing employment opportunities, and improving conditions for women on long-liners and mainstream fishing vessels.
Communications Specialist	4 weeks per year	2 trips per year	Document project; provide guidance on citizen's engagement, and beneficiary surveys.

Annex 5: Economic Analysis

MALDIVES: Sustainable Fisheries Development Project (Fourth South West Indian Ocean Fisheries Governance and Shared Growth Project)

Project level:

1. Benefits of the project refer mainly to the increase in income for the fishermen by (a) avoiding loss of income from capture fishery in the BAU scenario; (b) adoption of new technologies both in capture fishery and mariculture; (c) enhanced access to traditional and new export markets; (d) better value chain management; (e) adoption of quality standards; and (f) favorable business environment. Fisheries and mariculture activities are expected to become more beneficial also through favorable conditions regarding fish catch and market prices (such as the new opportunities created by the Free Trade Agreement between Maldives and China). Under the assumption that the fish stocks are depleting, project activities including conservation activities for capture and reef fishery will arrest the potential decline of fisheries-related GDP, and eventually increase it. Diversification through mariculture will add new jobs, income and higher domestic fisheries-related value-addition benefits for households. Potential increase fiscal revenues from license or penalties, however, are not counted among the project benefits, since they appear in the macro-economic benefits as "transfers".

2. Full realization of the expected project benefits will require some underlying conditions regarding project implementation such as: (a) reforms pertaining to fisheries management will be prepared and adopted without delay; (b) a strong political willingness will be demonstrated during the reform process including aspects regarding fees and penalties for non-compliance; (c) adequate attention will be given to reef management activities by Ministry of Environment (which is outside the realm of this project); and (d) full complementarity with other IFIs' investment is assumed. As these are issues that could never be absolutely guaranteed, the economic analysis for this project takes a conservative view. It assumes that only about 60-70 percent of the planned benefits will eventually occur, and the income/revenue from mariculture is estimated using most conservative estimates; whereas the cost estimates are more robust, and in the case of mariculture out-grower farms, the hidden costs are added.

3. Benefit-cost analysis is developed by comparing the increase in value creation for the fishermen with respect to the BAU scenario (which is also the baseline scenario), as follows: (a) for capture fisheries, enhanced monitoring and surveillance in yellowfin and skipjack tuna is expected to increase exports by around 5 to 40 percent compared to BAU, but would not be able to, within the project period, pull back prices that would be down by 10 percent due to uncertainties about the sustenance of stock. An additional loss of 20 percent in Maldivian exports in the BAU scenario is expected to be avoided by setting up VMS and electronic observation systems to comply with export requirements. The BAU scenario includes that the free trade agreement with China would help to compensate these effects by 10 percent, but reduction of catch 1 percent per annum, reduction of prices and exports down by 5 percent, and overall domestic price reduction by 1 percent per annum as per the BAU will not be arrested with the project interventions; (b) with regard to marine mariculture and reef fisheries, improved conservation in reef fisheries and increased value addition from mariculture would complement a growing BAU which includes out-grower farms of sea cucumber (by the MEDeP). Mariculture activities are expected to increase by 2.5 percent annually. See Tables A5.1 and A5.2, for details.

4. Overall, despite an expected fall in tuna and grouper catch, increase in (a) gross benefits from the project will be US$486 million; and (b) annual revenue creation compared to BAU by the project is expected to reach US$88 million in 10 years, and US$165 million in 20 years. The project investment is justified since the benefit cost ratio is estimated around 15, and the economic internal rate of return (EIRR) is more than 200 percent. See Table A5.3.

Table A5.1: Production, Export, Income & Employment in the BAU Scenario (without the Project)

	Tuna Fishing						Reef Fishing					Mariculture				
Year	Harvest (Ton)	Export (Ton)	Export Price (US$/Ton)	Income (Million US$)	Direct Jobs (Person)	Average Wage (US$/y)	Harvest (Ton)	Export (Ton)	Export Price (US$/Ton)	Income (Million US$)	Direct Jobs (Person)	Harvest (Ton)	Export (Ton)	Export Price (US$/Ton)	Income (Million US$)	Direct Jobs (Person)
2015	**127,400**	**71,000**	**1,800**	**188.71**	**9,554**	**7,792**	**3,510**	**3,159**	**30,000**	**20.51**	**2,632**	**0**	**0**	**30,000**	**0**	**0**
2016	121,487	71,804	1,786	187.84	9,411	7,792	3,159	2,843	30,000	17.56	2,184	0	0	30,000	0.00	100
2017	120,272	71,086	1,786	185.96	9,118	8,042	2,943	2,559	30,000	15.33	1,847	100	100	30,000	3.00	103
2018	117,867	62,698	1,786	178.16	8,836	8,299	2,662	2,303	28,800	12.91	1,507	103	103	28,800	2.97	106
2019	116,688	62,071	1,714	171.95	8,562	8,565	2,414	2,073	28,800	11.16	1,262	111	111	28,800	3.20	114
2020	115,521	61,450	1,714	170.23	8,296	8,839	1,961	1,658	27,360	7.99	875	119	119	27,360	3.26	123
2021	**109,745**	**58,377**	**1,629**	**153.63**	**8,039**	**9,122**	**1,602**	**1,327**	**26,813**	**5.88**	**625**	**128**	**128**	**26,813**	**3.43**	**132**
2022	109,745	58,377	1,596	151.73	7,789	9,414	1,317	1,061	24,132	4.12	424	138	138	24,132	3.33	142
2023	108,648	57,216	1,596	149.36	7,548	9,715	1,091	849	24,132	3.12	311	148	148	24,132	3.57	153
2024	107,561	56,643	1,596	147.29	7,314	10,026	928	679	24,132	2.40	232	174	174	24,132	4.20	180
2025	106,486	56,077	1,596	145.26	7,087	10,347	807	543	24,132	1.86	174	204	204	24,132	4.92	212
2026	**105,421**	**55,516**	**1,596**	**143.25**	**6,867**	**10,678**	**692**	**407**	**23,649**	**1.33**	**121**	**240**	**240**	**23,649**	**5.68**	**249**
2027	102,279	53,862	1,540	135.44	6,654	11,020	621	305	23,176	0.96	85	282	282	23,176	6.54	293
2028	99,231	52,257	1,540	130.89	6,448	11,373	585	229	22,712	0.70	60	331	331	22,712	7.52	344
2029	96,274	50,700	1,540	126.50	6,248	11,737	613	172	22,258	0.53	44	422	422	22,258	9.39	404
2030	93,405	49,189	1,540	122.26	6,054	12,113	681	129	21,813	0.40	32	538	538	21,813	11.74	475
2031	**87,903**	**46,291**	**1,400**	**108.14**	**5,866**	**12,501**	**793**	**96**	**21,377**	**0.30**	**24**	**686**	**686**	**21,377**	**14.66**	**558**
2032	82,725	43,564	1,400	101.36	5,684	12,901	955	72	20,949	0.24	18	875	875	20,949	18.33	656
2033	77,852	40,998	1,400	95.01	5,508	13,314	1,176	54	20,530	0.19	14	1,116	1,116	20,530	22.91	771
2034	73,266	38,583	1,400	89.06	5,337	13,740	1,468	41	20,120	0.15	11	1,423	1,423	20,120	28.63	906
2035	68,950	36,310	1,400	83.49	5,171	14,180	1,848	31	19,717	0.12	8	1,814	1,814	19,717	35.77	1,065
2036	**64,889**	**34,171**	**1,400**	**78.26**	**5,011**	**14,634**	**2,339**	**23**	**19,323**	**0.10**	**7**	**2,313**	**2,313**	**19,323**	**44.69**	**1,251**
Change/2016	-47%	-52%	-22%	-58%	-47%	88%	-26%	-99%	-36%	-99%	-100%	-	-	-36%	-	1151%

Table A5.2: Production, Export, Income & Employment with the Project
(But without any future Phase)

	Tuna Fishing						Reef Fishing					Mariculture				
Year	Harvest (Ton)	Export (Ton)	Export Price (US$/Ton)	Income (Million US$)	Direct Jobs (Person)	Average Wage (US$/y)	Harvest (Ton)	Export (Ton)	Export Price (US$/Ton)	Income (Million US$)	Direct Jobs (Person)	Harvest (Ton)	Export (Ton)	Export Price (US$/Ton)	Income (Million US$)	Direct Jobs (Person)
2015	**127,400**	**71,000**	**1,800**	**188.71**	**9,554**	**7,792**	**3,510**	**351**	**30,000**	**20.51**	**2,632**	**0**	**0**	**30,000**	**0.00**	**0**
2016	121,487	71,804	1,786	187.84	9,257	7,792	3,159	316	30,000	17.56	2,184	0	0	30,000	0.00	100
2017	**121,487**	**71,804**	**1,786**	**187.84**	**8,971**	**8,299**	**2,943**	**284**	**28,800**	**14.99**	**1,806**	**141**	**141**	**29,700**	**4.21**	**200**
2018	121,487	71,804	1,786	187.00	8,692	8,565	2,662	256	28,800	12.91	1,507	356	356	28,512	10.18	667
2019	121,487	70,368	1,714	181.97	8,692	8,839	2,414	230	28,800	11.16	1,262	487	487	28,512	13.93	923
2020	121,487	70,368	1,714	169.96	8,692	9,122	1,961	184	28,800	8.25	904	852	815	27,086	22.17	1,505
2021	**115,413**	**66,849**	**1,629**	**164.23**	**8,692**	**9,414**	**1,602**	**147**	**27,360**	**6.44**	**685**	**1,009**	**965**	**26,545**	**25.73**	**1,711**
Change/2017	-5%	-7%	-9%	-13%	-3%	13%	-46%	-48%	-5%	-57%	-62%	617%	586%	-11%	511%	756%
2022	115,413	66,849	1,629	164.23	8,692	9,715	1,602	403	26,813	12.79	1,317	1,021	977	23,890	23.45	1,523
2023	115,413	66,849	1,596	157.42	8,692	10,026	1,602	605	24,132	16.26	1,622	1,033	989	23,890	23.74	1,494
2024	114,259	59,563	1,604	156.31	8,692	10,347	1,602	749	24,132	19.50	1,884	1,064	1,020	23,890	24.48	1,487
2025	113,116	58,967	1,612	155.22	8,692	10,678	1,602	855	24,132	21.88	2,049	1,100	1,056	23,890	25.34	1,487
2026	**111,985**	**58,377**	**1,620**	**155.69**	**8,692**	**11,020**	**1,602**	**955**	**24,132**	**24.12**	**2,189**	**1,143**	**1,053**	**23,412**	**24.86**	**1,410**
Change/2017	-8%	-19%	-9%	-17%	-3%	33%	-46%	236%	-16%	61%	21%	712%	648%	-21%	491%	605%
2027	111,985	58,377	1,628	156.16	8,692	11,373	1,602	1,015	23,649	24.97	2,196	1,193	1,102	22,944	25.51	1,405
2028	111,985	58,377	1,636	156.64	8,692	11,737	1,602	1,042	23,176	25.09	2,137	1,252	1,160	22,485	26.32	1,412
2029	111,985	58,377	1,644	157.11	8,692	12,113	1,602	1,042	22,712	24.60	2,031	1,361	1,267	22,036	28.18	1,438
2030	111,985	58,377	1,653	162.42	8,692	12,501	1,602	1,042	22,258	24.13	1,930	1,500	1,404	21,595	30.60	1,481
2031	**115,413**	**60,164**	**1,661**	**162.91**	**8,692**	**12,901**	**1,602**	**1,042**	**21,813**	**23.67**	**1,834**	**1,677**	**1,529**	**21,163**	**32.75**	**1,492**
Change/2017	-5%	-16%	-7%	-13%	-3%	55%	-46%	267%	-24%	58%	2%	1092%	986%	-29%	678%	646%
2032	115,413	60,164	1,669	163.41	8,692	13,314	1,602	1,042	21,377	23.21	1,743	1,903	1,749	20,740	36.72	1,577
2033	115,413	60,164	1,678	163.92	8,692	13,740	1,762	1,042	20,949	23.03	1,676	2,192	2,031	20,325	41.78	1,686
2034	115,413	60,164	1,686	164.42	8,692	14,180	1,762	1,042	20,530	22.59	1,593	2,560	2,333	19,918	47.13	1,776
2035	115,413	60,164	1,694	164.93	8,692	14,634	1,762	1,042	20,120	22.17	1,515	3,029	2,786	19,520	55.15	1,948
2036	**115,413**	**60,164**	**1,703**	**165.44**	**8,692**	**15,102**	**1,762**	**1,042**	**19,717**	**21.75**	**1,440**	**3,627**	**3,365**	**19,130**	**65.25**	**2,158**
Change/2017	-5%	-16%	-5%	-12%	-3%	82%	-40%	267%	-32%	45%	-20%	2477%	2291%	-36%	1450%	979%

5. Subsequent phases of SOP will further increase marine capture benefits by $10 million and Mariculture and Reef benefits by $70 million. Real interest rate in Maldives reported at about 10 percent is used in the calculation of net present values (NPV). EIRR is estimated at 211 percent. Sensitivity analysis shows that even if only 50 percent of benefits accrue with a delay of 3 years, and costs are increased by 20 percent, the project will still be viable.

Table A5.3: Overall Economic Benefits of the Project

Economic Benefit Parameters	Current Project	With Phase 2 Project
NPV of Costs (20 years) including project cost	US$ 26,340,000	US$ 34,220,000
NPV of Benefits (20 years)–conservative estimate	US$ 486,060,000	US$ 525,480,000
Benefit/Cost Ratio (B/C Ratio)	14.02	15.36
Economic Internal Rate of Return (EIRR)	209%	211%
NPV of Net Benefits (20 years)	US$ 337,820,000	US$ 369,370,000
Sensitivity Scenario 1: Discount Rate of 14% (maximum probable commercial interest rate)	B/C Ratio: 11.68	B/C Ratio: 12.82
Sensitivity Scenario 2A & 2B: Benefits down by 20%, delayed by 2 years, costs up by 10%	B/C Ratio: 7.49 EIRR: 59%	B/C Ratio: 8.27 EIRR: 61%
Sensitivity Scenario 3A & 3B: Benefits down by 50%, delayed by 3 years, costs up by 20%	B/C Ratio: 3.64 EIRR: 33%	B/C Ratio: 4.03 EIRR: 35%

6. In addition to the direct gains, other benefits can also be estimated financially, but are not included in the conservative estimate of benefits of the project. These would refer to a multiplier effect through: (a) creation of jobs, taxes revenues, (b) enhanced food security for the remote island communities; (iii) increase in services related to the fisheries industry (fish feed, vessel building, installation and repair of mariculture cages, etc.); and (iv) job creation in fisheries related sectors.

7. Project Sustainability and Fiscal Impacts: The liability of the project to the national government arises from immediate expenditure on associated infrastructure (jetty, staff accommodation, mosque, etc., which is financed separately by the MoFA, outside the project) that will be needed for the multispecies hatchery. In the long-term there would be financing needs to operate and maintain the infrastructure and systems created by the project. Further, in the long term, MoFA will bear incremental costs for government staff associated with the institutional reforms, PMU staff expected to be absorbed in MoFA; continuing research, quality assurance, disease surveillance activities for mariculture; and continuing and regular upgrading of the augmented MCS, VMS, and electronic observation systems. These recurrent expenditures are estimated to be about US$1.37 million per year on the average for the first five years after closure of the project, and gradually increasing to US$2.73 and US$5.47 million per year for 10 and 15 years after the project. The out-grower farms financed by the project will be able to contribute about US$1 million per year from their profit (at a nominal rate of MVR1 per number of fish exported) at the most conservative scenario. This revenue will be able to cover all of the MoFA recurrent cost for about five years after closure of the project. Thereafter, additional infusion of resources will be required.

Mariculture Out-Grower Farm Level:

Market Analysis for Mariculture of sea cucumber and grouper:

8. An assessment of the demand and price for Tiger/Brown Marbled Grouper - *Epinephelus fuscoguttatus* and for Sandfish - *Holothuria scabra* at East Asian markets focusing on Hong Kong, SAR, China as the largest market was undertaken during project preparation to examine the potential opportunities and constraints for Maldives' mariculture access.

9. The regional fisheries market**:** The analysis found that more than 20 countries in Southeast Asia and the Pacific supply fish to the market in Hong Kong, SAR, China and that despite some fluctuations, the level of demand and imports have remained relatively consistent over the last decade. The main single suppliers in the region are Thailand, the Philippines and Indonesia. Therefore newcomers to this market are most likely to face competition from one of these three main regional suppliers. Hong Kong, SAR, China is a critical trade hub; 30-40 percent of all seafood is re-exported to other countries, making the Hong Kong, SAR, China market indicative of the wider regional market trends. China is the main final destination for high-end fisheries products in the region, such as Brown Marbled Grouper and Sandfish therefore competitiveness on this market is crucial for the development of a Maldivian mariculture sector. The Maldives and China concluded a free trade agreement in 2016, which will tax-exempt all Maldivian fish and seafood exports to China. Such market access facilitation, would considerably boost trade opportunities between the two countries, give trade advantage to Maldivian fisheries and thus provide a substantive incentive for new investments in the fishery and mariculture sector.

10. The grouper trade: The grouper trade in Hong Kong, SAR, China is largely under-reported and in 2012 it was estimated to be between 9,000 and 17,000 tons. Most of it moved directly into China where seafood consumption is expected to climb from the current 12kg per person to 36kg in 2020, thus offering significant opportunities for further growth in supply. While China is the largest producer of farmed grouper, consumers in China reportedly still strongly prefer and pay more for wild fish. As a result, capture grouper has in the last five years been better priced than the cultured equivalent, with the gap between the two increasing from 16 to 49 percent between 2011 and 2015. The price of capture tiger grouper has gone up by 25 percent, while the price for culture grouper has seen a drop by 23 percent during this period. Therefore, culture and capture fish must not be considered as direct substitutes and the price projections for mariculture grouper revenues in the Maldives should be based on cultured grouper price, which is significantly lower at US$25/kg than the US$60/kg currently paid for the local wild caught grouper. However, despite the Chinese preference for wild fish, the increase of price of capture tiger grouper would push a more price sensitive segment of the market towards culture grouper alternatives.

11. With capture fish quantities reducing, grouper farming is on the rise. The demand for fingerlings by farmers in Southeast Asia has increased. As grouper survives well and grows rapidly in culture, reaching market size (around 500g) in 9–12 months, there are an increasing number of hatcheries in Indonesia, Malaysia and Taiwan, China that supply the substantial increases in aquaculture production in the region. It is unclear to what extent the current average market price of 25USD/kg for cultured grouper will be maintained with the increase in supply. Price will also be influenced by the levels of supply of captured stocks and consumer perceptions of the characteristics and quality of the cultured alternative.

12. The sea cucumber trade**:** *Holothuria Scabra* (Sandfish) is among the highest value species and in great demand for Chinese cuisine. In addition to the desirability and market value, aquaculture production has primarily focused on this species in low-cost simple production systems in near-shore sea-grass beds as they are relatively sedentary, require no additional feed and can be reared to market size in approximately 12 months. Hatchery and nursery protocols for *Holothuria scabra* (sandfish) are fairly well developed in the Philippines, Vietnam, Malaysia and Indonesia. Existing methods for sandfish out-growing include pond and pen culture as well as sea ranching.

13. Contrary to other seafood in China, consumers tend to prefer cultivated sea cucumbers due to the larger size, greater number of needles, and uniform small cut, which is reflected in a wide price range even within a single species. There are high-end and low-end markets for sea cucumbers largely determined by the above criteria. The supply of sea cucumbers to the Hong Kong, SAR, China and Chinese markets is derived from countries across the Pacific. The Islands of Tonga, Kiribati, Fiji and New Caledonia export almost all of their sea cucumber harvest to the market in Hong Kong, SAR, China, while most sea cucumbers in China now are the product of aquaculture farms. According to value chain studies from the region, the sea cucumber industry is like an hourglass— large at each end and narrow in the middle. There are many small producers and consumers at either end of the chain, with a relatively small number of players in the

middle who coordinate the trade. At the end of the chain, the number of key Chinese customers is again very large. Such trade structure would theoretically allow for consolidation of prices by the few middlemen who have large influence over the trade.

14. Unlike most other agricultural or fishery product prices, which exhibit high seasonal variability, the price of sea cucumber has been stable for the past five years. This is remarkable considering that sea cucumber collection is somewhat seasonal. However, the product can be stored for very long periods when properly dried, which probably evens-out out the seasonality effect. However, research suggests that the most expensive dried seafood product is the Sandfish, export prices for which can quadruple at the high-end market in Hong Kong, SAR, China. For example, in Hong Kong, SAR, China the average price recorded in 2015 for Sandfish was US$303/kg with a maximum price reaching US$1,668/kg, while in Guangzhou, the average price recorded was US$137/kg, with highest US$200/kg. Despite some uncertainty about the reliability of the data in terms of absolute values, it is interesting to note the price range between maximum and minimum prices and the product characteristics that determine the pricing of each piece, such as size and the quality of post-harvest processing of the sea cucumber. An understanding of these price determinants provides an opportunity for producers to maximize the value of production.

15. Grouper exports and opportunities in Maldives: The current volume of grouper export trade in the Maldives is estimated at an average of 10 tons of live grouper each week or around 520 ton/year, of which according to government statistics for 2015, about 30 tons are Tiger Grouper. During 2015, the government offices price data indicates that the local price of live grouper fluctuated between US$8/kg (MVR124/kg) and US$3/kg (MVR50/kg), averaging US$5/kg (MVR78/kg). Therefore the total value of live tiger grouper trade can be estimated at around US$250,000.

16. According to the main live grouper traders, they are currently not operating at full carrying capacity, as there isn't enough live fish being sold. These businesses claim to have the infrastructure to be able to more than double their purchase of live fish, and transport, storage and live shipment. There are about two shipments that leave the Maldives every week primarily destined for Hong Kong, SAR, China where there are three main buyers. All exporters interviewed were confident that based on their business experience with these buyers they could state that the demand for live grouper outstrips supply within their current target market. The current reported prices that exporters obtain from Hong Kong, SAR, China are: US$35-45/kg for chilled and US$60/kg for live grouper, with live fish comprising over 90 percent of trade.

17. Current supply of live grouper from the Maldives to the Hong Kong, SAR, China market is marginal. If projected grouper production volumes remain within similar parameters, the influx of new production to the Hong Kong, SAR, China market would be insignificant in terms of the overall volume of trade, and, as such, is not expected to present a challenge or impact overall price. Further to this, established trade relations with key grouper traders in Hong Kong, SAR, China reduce transaction risks and costs in expanding the volume of business. Finally, the resource sustainability agenda is gaining support among affluent Asian consumers thus potentially improving the market standing of responsibly produced fish. Therefore, establishing environmentally sustainable production will allow Maldivian producers to target and capture growing high-end markets that demand sustainable sourcing, capitalizing on the "pristine waters" market image of the Maldives.

18. Despite the changing consumer preferences, marginal price premium for safe and wholesome products suggests that potential product differentiation on the basis of safety and quality may not translate into a significant price difference. Existing aggressive pricing strategies practiced by suppliers in order to win market share would put pressure on Maldivian producers to compete on lowering costs in accordance with major regional competitors such as Taiwan, China, Indonesia and the Philippines.

19. Lack of any commercial scale experience in grouper farming in the Maldives poses both the issue of market risk as well as risk associated with profitability of the production process development and associated costs (both investment and operational). In addition, there is a lack of adequate business

incentives and favorable environment, including technical support services to encourage private sector engagement in a new and unknown industry. Currently, sector development is also constrained by the reported lack of access to local financing for high-risk investment of considerable size. However, in summary, if the production cost is limited to, say, US$10 per kg, and the export price is above US$20 (much less than the US$35 they are getting for chilled grouper), the production is eminently feasible, provided minimum volume of 5000 tons could be established.

20. Sea cucumber exports and opportunities in Maldives: In contrast to grouper farming, sea cucumber farming has been practiced in the Maldives for a number of years. A single private sector operator has closed the production cycle and operates a hatchery that can supply over 4 million juveniles a year. Being the only private investor in commercial sea cucumber farming, there is a monopoly situation, especially as a result of the lack of alternative hatcheries. This business has expressed interest and is ready to expand production on the basis of individual out-grower scheme and provides the basis for industry development.

21. Currently, the company uses 132.5ha as a total out-grower area, practicing extensive farming through community council managed rental arrangements. The company does not yet hire community labour and it de facto rents an out-grower area in a lagoon against a payment of US$0.13/piece of cucumber grown. Under the present system, the company has started exporting up to 400,000 juveniles a year at US$0.52/piece (including freight) to Sri Lanka, as well as 6-7 tons of dry sea cucumber per year to Sri Lanka, China and Malaysia. According to the company, Sri Lanka is the main market as they have established good relations with the buyer and receive advance payment for the product. With export prices at around US$100-450/kg for dry sandfish, depending on size and quality of processing, and the average export to China around US$300/kg, sea cucumbers command a stable price.

22. Based on preliminary discussions, the company believes that over 3,000 individuals are interested in growing sea cucumbers. In taking things forward, company management wants to move from community based to individual based model, as they believe it is more viable. The company will provide technical assistance and sell juveniles at MVR8/piece. However farmers will have to fund their own initial investment for the venture. According to company estimates and a cost benefit analysis of the operations, families are expected to make an average annual profit of around US$1,390 (MVR 20,800).

23. There are many opportunities for Sandfish production to expand successfully. As the population of China and the Chinese diaspora abroad continue to grow, so does the demand for sea cucumber supply. Like other fishery goods, sea cucumbers from the Maldives benefit from market recognition as premium products and are already present in the regional market.

24. The existing experience provides better knowledge of characteristics (size, color, quality of post-harvest processing) that strongly affect price and ability to adhere to these would significantly increase value of production and related revenue. Initially, the concentration of production under one company would also allow for easy improvement of primary processing and minimize the potential inefficiencies in the distribution system, thus optimizing revenue while cutting costs. Good existing trade links with regional markets reportedly offer opportunities for immediate growth of the volume of trade.

25. In relation to sea cucumber expansion, the main constraints relate to ensuring that supply is large and stable enough to encourage large processing firms to engage with small farmers. Also, the absence of officially formulated and recognized grades and standards for sea cucumber allows exporters to price production arbitrarily, which could be detrimental to out-grower's economic benefits and participation incentives. Overall, the lack of adequate business incentives and clear business establishment process, including technical support services inhibit investment. Finally, a major constraints is the lack of local financing at both high-end commercial operator establishment level, as well as low-end, micro level financing needed for out-growers' initial investment.

Multispecies Hatchery

26. Need for establishment of a multispecies hatchery: When starting mariculture, the first need for supply of juveniles of the grown species. There are three methods to get juveniles for a mariculture farm:

(a) Capture juveniles in the natural environment: This is only suitable if the reared species can be found in local waters. This method is widely developed in Egypt (for mullets) or in South East Asian countries (for groupers, napoleon fish, etc.). It can be performed through specific capture (small fry are caught in great quantities, stocked and then sold to farmers) and sometimes it is linked to artisanal fisheries (small fish, captured by artisanal fishers, not commercially valuable are kept alive and stocked in cages for on-growing until market size). This method presents several problems:

(i) Use of non-selective nets or traps which capture other commercially interesting species not grown by farmers and usually killed after grading, resulting in biodiversity losses, stock depletion, capture reduction for fishers;

(ii) Sometimes large mortality, over 50 percent, of juveniles during harvesting, transport and farm acclimatization takes place, which means that there is always a need to catch more and more juveniles to supply the farms, also leading to biodiversity reduction, quick stock depletion, competition with local fishers; and,

(iii) Often there is a mix of different species from the same family (not easy to grade) which have never the same growing performance in farms, results in farm management problem and sometimes decrease in production and marketing problem. In Maldives, considering the current levels of stock depletion, this method cannot be used for sea cucumber, grouper or milkfish (but can be used for other reef fish species as and when technology for culture is developed).

(b) Import juveniles from foreign hatcheries: Local species, like grouper, are widely distributed into the Indo-Pacific region and other countries that have the technology to produce grouper juveniles in hatcheries (UAE, Kuwait, Malaysia, Indonesia, etc.). However, this option has present potential problems:

(i) Grouper juveniles are presently expensive considering low survival rate during larval rearing (2 to 10 percent for grouper species – compared to 50-60 percent for barramundi and 75-80 percent for European sea bass or sea bream). International price is around US$ 1 piece ex-farm, which is similar to what it will take to produce juveniles locally;

(ii) Transportation – possible exclusively by air freight - for live juveniles is expensive;

(iii) Increase in logistic cost and will need additional infrastructure in places away from Malé;

(iv) The need to pack less fingerling for the same quantity of water in a bag will mean increase air freight cost (for more water) that can also raise mortality during transport;

(v) Risk of genetic contamination to local grouper stock if farmed groupers escape from tanks or cages to natural waters;

(vi) Risk of introduction of new disease in natural waters if juveniles are not pathogen free which, in turn, means additional loss of biodiversity, stock reduction and decline of overall fisheries.

Even if all of the above risks can be managed, there will be a need to change the Maldivian policy of prohibition of import of all live animals (to maintain pristine environmental quality of the waters of Maldives). A change is not advisable not only because of the environmental risks, but also to protect the premium international price that fish from Maldives command due to its “pristine environment” branding.

(c) Produce juveniles in local hatcheries. Technology for grouper spawning and larval rearing is now mastered for some local grouper species, such as the brown marbled grouper, and such technology can be "easily" developed and transposed to Maldives.

27. Given the above options and related risks, the project has no other option but to finance establishment of a multispecies hatchery in Maldives. It is important to note that even this option will have its own challenges to be managed appropriately: These challenges include:

(a) Production of juveniles needs local availability of technology. The MRDF has performed reproduction and larval rearing of brown marbled grouper but only at an experimental stage. Introduction of foreign technology and technical assistance, and training for local technicians will be needed;
(b) To be profitable, the hatchery will need a scale of annual production, usually several millions of juveniles, an issue more important for grouper[23] considering the low survival rates during larval rearing; investment is higher for grouper compared to hatcheries of other species. For grouper, production should consider a minimum of about 5-7 million juveniles per year (and perhaps more in Maldives considering the logistic problems).

28. Need for a design, build, operate and transfer (DBOT) contract: Considering the small production needed at the beginning to supply to a small number of out-grower farms, no private company will take the option to finance building a hatchery (especially for grouper), as the expected return is low in the initial years, and there is low probability of making any profit until several years later. Therefore, the project has to finance this hatchery. It is important to select a bidder (either an existing commercial hatchery, or a consulting firm with grouper experience or both) to be able to design, build and equip the full hatchery. The project will need to finance hatchery operations during the initial years of production, including the technical assistance and training of local technicians that will be required. Part of the financing can be compensated by the sales of juveniles to farmers, and by the exports of extra juveniles if any. Once mariculture is established in Maldives, the hatchery can be sold or leased to a private company for operation (but with protection against potential monopolistic practices). Given the above three requirements, the multispecies hatchery will be build and operated through a DBOT contract for 5-10 years.

29. Size and scale of hatchery: Detailed cost estimates and technical analyses were undertaken for several options. Between hatcheries of capacities of production of 2 and 5 million juveniles, the investment cost difference is less than US$500. Similarly, the requirement of working capital also does not vary by more than US$500 per year. Indirect operating costs, including administration, maintenance, technical assistance and local technician training, are roughly the same for a small or a large project. A hatchery with production of 2 million juvenile will never see commercial profit, as the sales are insufficient to finance operation and management costs. Even a hatchery with production of 5 million juveniles will break even only after three years of sales. In effect, production capacity of 5 million juveniles is the bare minimum that should be planned for a hatchery for grouper (and milkfish) in Maldives (in other countries, the building and installation costs could be smaller, and a slightly smaller hatchery might become profitable after 3-4 years).

Out-Grower Mariculture Farms

Sea Cucumber (Sandfish) farming

30. The main objective of this investment will be to develop a technically viable and commercially sustainable micro-enterprise model for sea cucumber production and processing. The technology to be utilized is largely based on a low-cost extensive system of production and a cage-culture model.

[23] This means a hatchery producing juveniles of grouper will need more surface area, surface facilities, and equipment to produce the same amount of juveniles as compared to another species.

31. The main markets for dry sea cucumber are in China. The market is segmented into high-end and low-end, the price difference between the two being significant. The access to either market is largely determined by the characteristics of the product, such as size and post-harvest handling/processing, all of which hugely impacts farm- gate prices. Therefore, the main challenges will be related to the technical management, which would require consistent quality and volume of production to be maintained in order to sustain stable revenues and trade linkages.

32. There are a few main assumptions and risks associated with the successful development of the micro-enterprise. For example, the high level of dependency on a hatchery and the 'de facto' monopoly over supply and sales can lead to unequal power-relations and price distortions.

33. The financial analysis of the projected investment, operation costs and the returns suggests an IRR of 96 percent. Such high rate of returns is considered possible as the running costs of the operation are very low, due to the nature of the production activity, while the returns are comparatively high, as this is a high-value product.

34. For a business employing two people, with a projected maximum growth of up to 4 cages within the first three years, the projected income is as much as US$220 per person per month in the first year and would grow substantially after that.

35. The production pattern shows that every five years, the 9 month growth cycle will overlap, allowing for two harvests within one calendar year, thus peaking income accordingly. As a result, the financial projections show that the cash-flows turn positive in the second year itself, and that the profit margin is 11-13 percent and peaks at 31 percent every 5 years, making the investment attractive and relatively robust to absorb potential fluctuations in costs or revenues.

36. During these peak production years, net income can go to as much as US$2,760 per person per month in peak years or once every five years. During the four years of the five year cycle, the projected net income is still relatively high and attractive at just under US$1,200 per person per month. Note that this net income is in addition to accounting for provision of self-wages (MVR183 per person per day), expenditure on hired employees, and assuming a commercial interest rate of 10 percent on debt; further, there could be substantial opportunities to increase the net income.

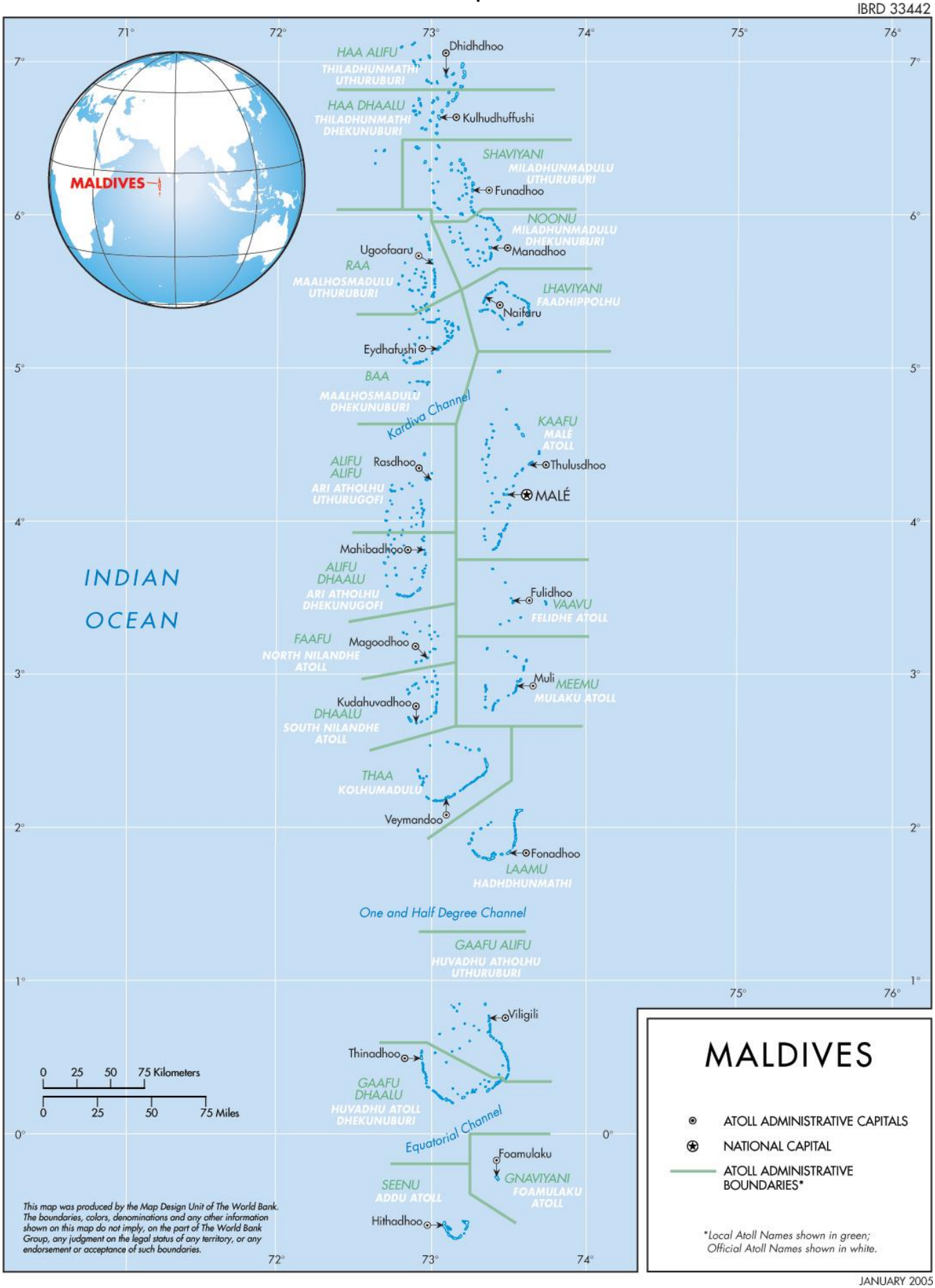
Grouper Farming

37. The core activity of the micro-enterprise will be the successful out-grower of market-sized grouper for live exports. The main anticipated markets for live grouper are the Asian markets of China, which are currently trading live wild-caught grouper with the Maldives. The farmed fish is expected to be traded along the same channels, though prices are expected to be lower for farmed than capture fish.

38. The proposed micro enterprise is associated with numerous risks. This would include: high level of production risks, as the lack of experience could lead to higher losses; high level of supply chain risks, as there are currently no commercial hatcheries or a source of fish feed, it is assumed that both these types of business/industries will be set up to answer the needs of local out-growers; potential scale-up risk: an individual micro-enterprise cannot be viable without the establishment of the rest of the industry; and finally, high system risk: the micro-enterprise is only viable if the right macro environment is created to support the establishment of an entire mariculture sector, generating enough investment and revenue to justify the establishment of all necessary support services.

39. While the associated risks are high, the projected IRR of 225 percent and profit margin of 35-40 percent, after the first year of negative cash flow make the investment attractive and robust to potential fluctuations in costs or revenues. The micro-enterprise is expected to generate US$7,837 of annual profit in the first year, and reach a profit of US$22,412 by the eighth year.

Map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MULAKU ATOLL
Kudahuvadhoo
DHAALU
SOUTH NILANDHE ATOLL
THAA
KOLHUMADULU
Veymandoo
Fonadhoo
LAAMU
HADHDHUNMATHI
One and Half Degree Channel
GAAFU ALIFU
HUVADHU ATHOLHU UTHURUBURI
Viligili
Thinadhoo
GAAFU DHAALU
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MALDIVES
ATOLL ADMINISTRATIVE CAPITALS
NATIONAL CAPITAL
ATOLL ADMINISTRATIVE BOUNDARIES*
*Local Atoll Names shown in green; Official Atoll Names shown in white.
JANUARY 2005