



GULF OF MOTTAMA MANAGEMENT PLAN

PROJECT IMPLEMENTATION AND COORDINATION UNIT – PCIU
29, MYO SHAUNG RD, TAUNG SHAN SU WARD, MAWLAMYINE,
MON STATE, MYANMAR

COVER DESIGN:
NYANSEIK RARMARN
KNOWLEDGE MANAGEMENT AND COMMUNICATION OFFICER
GULF OF MOTTAMA PROJECT (GOMP)

GULF OF MOTTAMA MANAGEMENT PLAN

Published: 16 May 2019



This management plan is endorsed by Mon State and Bago Regional Governments, to be adopted as a guidance document for natural resource management and sustainable development for resilient communities in the Gulf of Mottama.

This page is intentionally left blank

Gulf of Mottama Project (GoMP)

GoMP is a project of Swiss Agency for Development and Cooperation (SDC) and is implemented by HELVETAS Myanmar, Network Activities Group (NAG), International Union for Conservation of Nature (IUCN), and Biodiversity and Nature Conservation Association(BANCA).

ACKNOWLEDGEMENTS

The drafting of this Gulf of Mottama Management Plan started early 2016 with an integrated meeting on May 31 to draft the first concept. After this initial workshop, a series of consultations were organized attended by different people from several sectors.

Many individuals and groups actively participated in the development of this management plan. We would like to acknowledge the support of the Ministries and Departments who have been actively involved at the Union level which more specifically were Ministry of Natural Resource and Environmental Conservation, Ministry of Agriculture, Livestock and Irrigation, Forest Department, Department of Agriculture, Department of Fisheries, Department of Rural Development and Environmental Conservation Department.

In both Mon State and Bago Region the drafting received tremendous support from its leaders Dr. Aye Zan, Chief Minister Mon State and Mr. Win Thein, Chief Minister of Bago Region. In Bago Region and Mon State support was obtained at Ministerial level from Ministry of Natural Resource and Environmental Conservation, Ministry of Agriculture, Livestock, Irrigation, Transportation and Communication. At Departmental level from Forest Department, Department of Agriculture, Department of Fisheries, Department of Rural Development and Environmental Conservation Department as well as officers from Thaton and Bago Districts offices and Township officers from Kyaikhto, Bilin, Thaton, Mawlamyine, Kawa and Thanatpin. The State Parliaments members from these townships reviewed the drafts as well. Those departments that are now part of the Mon State and Bago Region Coastal Resource Management Committees are thanked for their involvement in reviewing this management plan.

It is also important to acknowledge the active participation of community member representatives who contributed to these efforts, including members of the Fishery Development Associations from Mon State and Bago Region, Fishery Partnership Platform from Rakhine, Ayeyarwaddy and Tanintharyi and all representatives from coastal communities' fishermen, farmers and local conservation groups members.

We also acknowledge the participation of the private sector, specifically the Myanmar Fisheries Federation, Mawlamyine Holding limited, and the participation of academics from Mawlamyine University and Bago University.

The development was made possible because of the continuous support of the Swiss Agency for Development and Cooperation (SDC) and the active participation of the Gulf of Mottama Project staff of the Consortium members led by HELVETAS, IUCN, NAG and BANCA.

Than Htike Aung,
Project Manager, Gulf of Mottama Project

Copy Rights

© All Right Reserved by

Swiss Agency for Development and Cooperation



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

**Swiss Agency for Development
and Cooperation SDC**

TABLE OF CONTANT:

TABLE OF CONTANT:	6
ABBREVIATION:	7
OVERVIEW OF THE MANAGEMENT PLAN	8
BACKGROUND INFORMATION ON THE GULF OF MOTTAMA	9
SECTION 1. THE GULF OF MOTTAMA – A UNIQUE SITE.....	9
1.1 Administrative Boundaries.....	9
1.2 Physical Features	10
1.3 Ecological characteristics	10
1.4 Coastal Communities of the Gulf of Mottama	13
SECTION 2. THREATS AND OPPORTUNIES TO GULF OF MOTTAMA’S COASTAL NATURAL RESOURCES	17
2.1 Threats	17
2.2 Opportunities for the effective management of the GoM.....	20
GOVERNANCE CONTEXT	22
SECTION 3. CURRENT GOVERNANCE AND MANAGEMENT MECHANISMS	22
3.1 International agreements & recognition	22
3.2 Governance of Coastal Natural Resources.....	23
3.3 Governance of the Gulf of Mottama’s coastal natural resources.....	24
3.4 Village, District, and Township-level institutions and policies	24
3.5 Supporting Institutions	25
THE MANAGEMENT PLAN: PRINCIPLES, OUTCOMES AND OUTPUTS, AND IMPLEMENTATION	26
SECTION 4: OPERATIONAL DESCRIPTION.....	26
4.1 Guiding Principles.....	26
4.2 Outcomes and Outputs.....	27
SECTION 5: IMPLEMENTATION.....	33
5.1 Implementation process	33
5.2 Monitoring and evaluation	34
5.3 Funding strategies	34
5.4 Long-term application of the Management Plan	35
ANNEX.....	37

ABBREVIATION:

BANCA	Biodiversity and Nature Conservation Association
CBDRM	Community-Based Disaster Risk Management
CEPA	Communication, Education, Participation and Awareness
CNRMP	Coastal Natural Resource Management Plan
CSO	Civil Society Organization
DoF	Department of Fisheries
DRM	Disaster Risk Management
EAAF	East-Asian Australasian Flyaway
FDA	Fisher Development Association
GAD	General Administration Department
GoMP	Gulf of Mottama Project
IDP	Internally Displaced Peoples
IUCN	International Union for Conservation of Nature
LCG	Local Conservation Group
MFF	Myanmar Fisheries Federation
MoU	Memorandum of Understanding
NAG	Network Activities Group
NGO	Non-Governmental Organization
NWC	National Wetland Committee
SBS	Spoon-billed Sandpiper
SDC	Swiss Agency for Development and Cooperation
SME	Small and Medium Enterprises
VDC	Village Development Committee

OVERVIEW OF THE MANAGEMENT PLAN

The Gulf of Mottama (GoM) is one of the most important and unique intertidal wetland systems in the world. Because of this, it was declared a Ramsar site in 2017. It is home to important habitats, species of conservation concern, commercially important fisheries, and communities that rely on its natural resources. These resources and livelihoods face many threats. Fisheries stocks are declining. Migratory shorebirds face the risks of hunting and habitat degradation. Livelihood opportunities and access to services are limited for communities. Serious erosion along the western bank of the Gulf is destroying agricultural lands and displacing communities.

To protect the GoM's natural resources and the well-being of its local communities, management must address ecosystems, livelihoods, and governance. The Government of Myanmar has recognized the importance of properly managing the GoM. Similarly, strong interest has been demonstrated by Mon State and Bago Region governments, coastal communities, local universities, the private sector, and local and international organizations. This is a significant opportunity to develop effective natural resource management for the Gulf.

This Gulf of Mottama Coastal Natural Resources Management Plan is a framework for the long-term management for the Gulf's coastal natural resources. This Management Plan's vision is: **The unique biodiversity of the Gulf of Mottama is conserved and sustainably developed in order to benefit human communities that depend on it.** Work toward this vision will be guided by three interlinked Outcomes:

Outcome 1: Livelihoods are secured and diversified to build communities' resilience

Outcome 2: Coastal natural resource use is sustainable and well-managed, and biodiversity is conserved

Outcome 3: Coastal natural resource governance is coordinated and effective, and awareness of the value of the GoM is raised.

Implementation Approach for the Management Plan: This Plan should be implemented through co-management, with communities, government, and other institutions, including the private sector, working together. The recent formation (2017) of a Union-level Coastal Resource Management Committee (CRMC), and the subsequent formation of state- and regional-level CRMCs, is an exciting opportunity for the management of the Gulf. These CRMCs hold roles and responsibilities that are critical for GoM management. Effective management of the Gulf calls for strong links between the Mon State and Bago Region CRMCs and stakeholder groups at the township and village level, in addition to links to the private sector and other institutions, such as CSOs and universities.

Gulf of Mottama Project (GoMP): The GoMP is a project (2015-2024) of the Swiss Agency for Development and Cooperation (SDC). It is implemented by a consortium comprising HELVETAS Swiss Intercooperation (HELVETAS), the International Union for Conservation of Nature (IUCN), Network Activities Group (NAG) and Biodiversity and Nature Conservation Association (BANCA), to support the sustainable management of the GoM. The GoMP will support and build capacity for the implementation of the Management Plan.

BACKGROUND INFORMATION ON THE GULF OF MOTTAMA

SECTION 1. THE GULF OF MOTTAMA – A UNIQUE SITE

1.1 Administrative Boundaries

The Gulf of Mottama covers the area within a straight line between the southern point of Pyapon Township in Ayeyarwady Region and the southern point of Mudon Township in Mon State. It is bordered by Yangon Region in the west, Bago Region in the north, Mon State in the east, and the Andaman Sea in the south (www.mimu.org). The GoM is under the jurisdiction of the Mon State Government, Yangon and Bago Regional Governments, and the General Administrative Department. The GoMP has thus far focused on Kyaikto, Bilin, and Thaton townships in Mon State, and Kawa and Thanatpin townships in Bago Region (Figure 1). Extensions of activities are planned to Paung and Chaungzon townships in Mon State, Waw township in Bago Region, and Yangon Region, including work to extend the current Ramsar Site.



Figure 1. Gulf of Mottama administrative areas, and GoMP villages (orange circles; to be expanded in 2018-2022), with the existing Ramsar site (current designation in red) and future extensions to the Ramsar site to be proposed.

1.2 Physical Features



Mudflat area in the Gulf of Mottama _ Photo © Min Nyan Seik, KMCO/GoMP

The GoM is one of the most dynamic estuaries in the world, characterized by sediment redistribution, erosion, and accretion on a large scale. It is heavily influenced by tides as well as monsoons. Due to the flow of sediments from four large rivers, the Ayeyarwady, Yangon, Sittaung, and Thanlwin (Robinson et al., 2007), the GoM has extensive mud flats covering around 4,000 km² (MacKay 2017), the largest in Southeast Asia. With the Gulf's shallow depth (less than 30 meters) and strong tidal forces, these sediments are constantly remobilized, creating one of the largest known areas of perennial turbidity, up to 45,000 km² (Ramaswamy et al. 2004, Brewer et al. 2015, MatAmin et al. 2015). As a result of the Gulf's funnel shape, its tidal cycle is extreme in speed and amplitude, causing a powerful bore, a very rare phenomenon.

1.3 Ecological characteristics

Critical habitats: The GoM includes coastal wetlands (intertidal mud flats) and inland wetlands (saline and brackish marshes and pools), as well as nipa palms, mangroves, and freshwater swamp forests. The waters of the upper GoM are largely brackish, with substantial freshwater discharge and turbidity, while the lower GoM is more marine. These habitats serve as important areas for aquatic and marine species, including spawning areas and nursery grounds for commercially important fisheries stocks. The importance of mud flats for fisheries and other species (including migratory birds) should be considered when planning restoration of other habitat types, particularly mangroves, which might degrade mud flat habitat (Zöckler *et al.* 2013). It is likely that the upper Gulf is not suitable for mangroves due to strong tidal turbulence, turbidity, and highly dynamic substrate (Zöckler *et al.* 2013), but mangrove forest remnants exist farther south along Mon State.



Critically Endangered Spoon-billed Sandpiper _ Photo © BANCA

Key species:

The GoM is identified as the most extensive and significant intertidal mudflat system in Myanmar for shorebirds, fish and other biodiversity (Zöckler, Delany, & Barber, 2013). Its highly productive intertidal mudflats provide a wintering site for an estimated 150,000-200,000 waterbirds, including Critically Endangered Spoon-billed Sandpipers (*Calidris pygmaea*), and Endangered Nordmann's Greenshanks (*Tringa guttifer*) and Great Knots (*Calidris tenuirostris*). Over 70 waterbird species have been recorded here (EAAFP).

The Spoon-billed Sandpiper (SBS) can be seen as a flagship species for the GoM. Breeding in Russia, the SBS annually migrates more than 8,000 km to winter at sites in South and South-East Asia along the East-Asian Australasian Flyway (EAAF). Of an estimated global population of 120-200 pairs (Zöckler et al. 2016, Clark et al. in prep, BirdLife International 2017), over 50% are estimated to winter regularly in Myanmar, primarily in the GoM. As an important wintering site, the GoM is vital to ensure the vitality of the small remaining population.

In 2018, interviews with fishers led to field surveys confirming the presence of Indo-Pacific finless porpoises (*Neophocaena phocaenoides*; Vulnerable), Irrawaddy dolphins (*Orcaella brevirostris*; Endangered), and Indo-Pacific humpback dolphins (*Sousa chinensis*; Vulnerable) in the Gulf of Mottama along the coast of Chaungzone. Anecdotal reports suggest that marine mammals are also present farther north in Mon State. In early 2018, a finless porpoise was captured and released in a tributary of the Sittaung River.

There is little systematic information available on fisheries ecology. Fish species of the GoM are primarily estuarine. Tin Wai et al. (2014) recorded 39 species and Thazin Htet (2017) reported

40 species, far fewer than the over 70 species in southern Mon State (Tint Swe, 2011). In addition to fish species, the GoM hosts mud crabs species *Scylla olivacea*, *Sesarma intermedian*, *Metaplex elegans*, *Uca annulipes*, and *Tubuca dessumidri* (Aye Moe, 2017), and large populations of benthic (bottom-dwelling) invertebrates (e.g. ragworms, lugworms, sandhoppers). These diverse and abundant benthic invertebrates (Ansari et al. 2014) are a potentially important source of food for fish and birds.

Ecosystem services: The known and likely services derived from the GoM include:

Provisioning services: The resources and ecosystems of the GoM support key livelihoods: capture fisheries (including fishes and mud crabs), aquaculture, and agriculture, including livestock. Through the possible dispersal of fisheries species beyond the GoM, the provisioning services related to fisheries in the GoM might extend as far as the Bay of Bengal. Other provisioning services might include ground water recharge, but this has not been confirmed (RIS 2017, Wood and Halsema 2008).

Regulating services: Not much is known about the regulating services of the GoM. However, wetlands have been documented to contribute to climate regulation, hydrological regulation, pollution control, and protection against erosion and other natural hazards (Millennium Ecosystem Assessment 2005; Wood and Halsema 2008). These services are challenging to assess the nature and extent of the protection offered must be evaluated.

Cultural services: Spiritual, recreational, aesthetic, and educational: As yet, the cultural value of the GoM to its residents has not been evaluated. Cultural services include bird-watching, due to the global importance of the GoM for waterbirds, as well as educational opportunities; for example, BANCA has a conservation education center in Kyaikhto that heavily features the species, habitats, and value of the GoM.

Supporting services: The mudflats of the GoM contain nutrient-rich sediments which support benthic invertebrates, which support local fisheries. Many fish species use the estuary as spawning and nursing grounds before migrating to sea. Diverse populations of waterbirds, including threatened and charismatic species, depend on the GoM as wintering habitat. Wetlands are known to also play an important role in sediment retention, accumulation of organic matter, and nutrient cycling (Millennium Ecosystem Assessment 2005), but these processes have not yet been studied in the GoM.

1.4 Coastal Communities of the Gulf of Mottama



Kyar Si Aung, GoM Project Village _ Photo ©Min Nyan Seik/KMCO-GoMP

About 86 coastal villages (2 to 5 km from the coast) are present in the GoM in Mon State, Bago Region, and Yangon Region, with around 62,000 residents (25,419 households). A Baseline Survey for the GoMP in 2015 provides much of the information described here (Khin Tar Tar et al. 2015). Many of these coastal villages are relatively remote. Major livelihoods are fishing, farming, livestock rearing, as well as casual wage labor depending on work opportunities. It is important to note that 52% of villagers in Mon State and 47% in Bago Region are recorded as landless. Issues for landless individuals include lack of access to credit, and high interest rate for loans due to lack of assets to use as collateral (Khin Tar Tar et al. 2015). The ethnic mix of population living around the GoM includes Bamar, Mon, Kayin, Rakhine, Karen, and Indian.

Migration

The population trends in the GoM are heavily influenced by internal and international migration. Migration is primarily linked to seeking improved livelihood opportunities, though in some cases displacement can result from natural disasters or conflict (Maharjan and Myint 2015). Substantial coastal erosion in Bago Region has led to loss of agricultural land and displacement of communities, from which community members often migrate to the Mon State bank, where new land has been formed (though this land is not immediately arable due to high salinity).

Fisheries Livelihoods



Fishermen fishing in the Gulf of Mottama _ Photo ©Min Nyan Seik/KMCO-GoMP

Capture fisheries are an important source of income for people involved throughout the market chain, from fishers to processors, traders, ice-makers, truck drivers, and fishing gear producers. Fishing grounds include river channels, seasonal riverine lakes, estuaries, inundated paddy fields and low-lying areas, perennial lakes and tanks, irrigation canals and tributaries, and the sea. In Bago Region, fisheries are primarily freshwater, while coastal fisheries are much more important in Mon State (Salagrama, 2015). The most commonly used fishing gears in the GoM are trammel net, drift gill net, gill net, stake net, beach seine, bag net, crab trap, and crab hook (Thazin Htet, 2017; Tint Wai et al., 2014). Fishing practices range from manually-operated fishing by wading or paddle boats in submerged rice paddies and floodplains, to 8-11m boats using outboard or inboard motors. There are no large boats, e.g. mechanized trawlers or purse-seiners, due to the GoM's shallow depth.

Economically important species include Croaker or Rosy Jewfish (*Johnius belangerii*), Toli shad (*Tenualosa toli*), Hilsa shad (*Tenualosa ilisha*), Seabass (*Lates calcarifer*), Threadfin (*Polynemus indicus*), Sea catfish (*Arius thalassinus*), River catfish, Mullet (*Liza parsia*), Whiting (*Sillago sp*), Bombay Duck (*Harpadon nehereus*), and mixed species of prawns. Mud crab harvesting is a valuable source of income for small-scale fishers, women, and landless households.

On-farm livelihoods



GoM Project's paddy demonstration plot _ Photo ©Min Nyan Seik/KMCO-GoMP

Agriculture: Erosion and saltwater intrusion are driving a decrease in agricultural land. Saltwater intrusion is especially acute in the dry season, resulting in low productivity and, often, the total loss of paddy fields (Theingi Myint, 2015). From the Baseline Survey, it appears that most individuals engaged in agricultural cultivation own their land, while others rent land (Khin Tar Tar et al. 2015). However, about half of the general population in these areas are landless, including those working as labor in agriculture. Access to land for agriculture is often not available to poorer households, as the registration system can be prohibitively expensive for low-income families.

Livestock: In the Baseline Survey, 47.8% of respondents in Mon State and 62.7% in Bago Region breed livestock, primarily for household use (Khin Tar Tar et al. 2015). Cattle are used for farming (plowing and hoeing for the land in preparation for cultivation, threshing, and providing transportation of farm products from fields to homes and barns by carts), as well as for fetching water from one village to another, or for hire by other farmers in exchange for wages. Pig and goat husbandry is mainly for market sale, while chickens and ducks are mostly for household consumption.

Indigenous aquaculture: Indigenous aquaculture has reportedly been conducted for at least 40 years and is widely practiced in Kawa and Thanatpin Townships, Bago Region, and Thaton Township, Mon State (Soe Min Oo & MacKay, 2017). The system is based on monsoon seasons: as the rice fields flood with monsoon rains in June and July, fish move from fish ponds, rivers, creeks, and canals to the flooded rice paddies, where they reproduce and feed.

Wage Labor & Off-farm Livelihoods

Wage labor is a major source of income for local communities, particularly for poor landless households. In the fisheries sector, men work as labor on boats for trips ranging from one to several days at sea. Women are involved in fish-processing (drying and boiling fish and shrimp). In agriculture, men work at land preparation, sowing, fertilizing, pest control, rice transplantation (June-July) and harvesting rice (October-November). Women also work as labor in agriculture (sowing, weeding and harvesting).

Infrastructure & access to services

Poor transportation infrastructure limits access to basic services and education. Health centers are in township capitals and are often difficult to access especially during the rainy season. Limited access to sufficient and safe water poses a great challenge for GoM communities, agriculture, and fish processing. Water sources are primarily wells (public and private) and public lakes; some communities also have rainwater collection tanks (Khin Tar Tar et al. 2015).

SECTION 2. THREATS AND OPPORTUNITIES TO GULF OF MOTTAMA'S COASTAL NATURAL RESOURCES

Though the full nature and extent of threats to the GoM's coastal natural resources are yet unknown, substantial threats have been identified.

2.1 Threats



Illegal fishing net (Than Zagar Net) _ Photo ©Myint Oo_VDC/Aung Kan Thar Village

Overexploitation: Unsustainable resource use appears to be the most immediate threat to the GoM's coastal natural resources. Fisheries stocks have plummeted in the past decade, largely as a result of overfishing and the use of illegal gear. In particular, illegal small-mesh stake nets known as Than Za Gar Pike nets catch juvenile fishes and have been identified as a major problem for local fisheries. These can stretch from 1.5 to 4 km in length, functioning as a large fish trap (MacKay and Soe Min Oo 2017). This type of fishing is concentrated near the mud flats in Mon State from Kyaikhto to at least Thaton and near the junction of Bago and Yangon Regions (MacKay and Soe Min Oo 2017). Illegal stake-net fishing boats are owned by medium-scale fishers and businessmen mainly from Kyaikhto town (MacKay and Soe Min Oo 2017). There is essentially no enforcement of fisheries regulations. The open access nature of coastal fisheries in the GoM makes managing fishing effort a huge challenge.

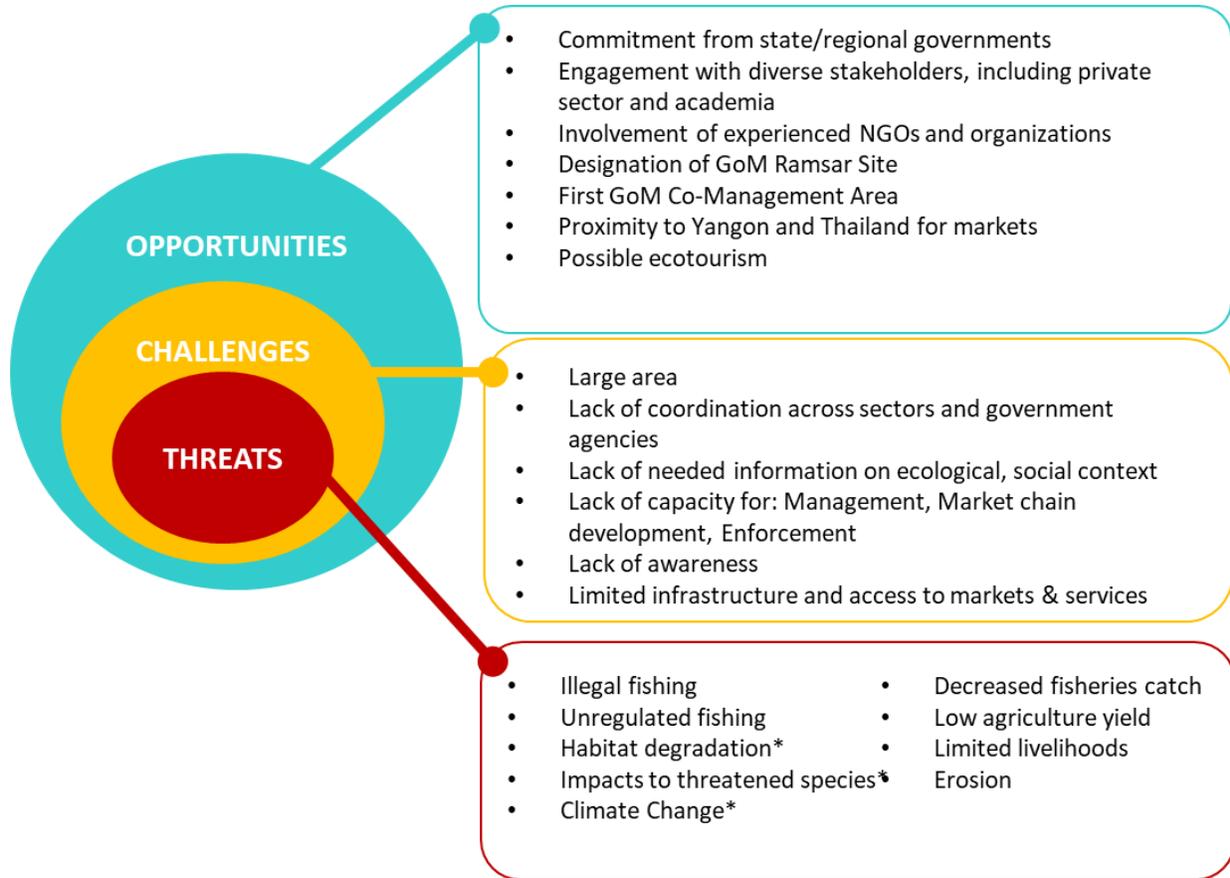


Figure 2. Threats, challenges, and opportunities for coastal resource management in the GoM

Habitat change and degradation: Further research in the GoM is needed on status of habitats and possible threats. In Myanmar, mangroves are declining, largely due to deforestation for fuel and conversion of mangrove areas for agriculture and aquaculture uses. Specific research on mangrove areas in Paung and Chaungzon will be important to understanding these dynamics in the GoM. Substantial erosion along the west coast and accretion along the east coast represent drastic habitat changes for species in that area (MacKay et al. 2017, Whitty et al. 2017), as well as for communities (see “Erosion and Sedimentation” below). There are some industrial and infrastructure development projects in the GoM, including sand mining and bridge construction, which might have impacts on flow and sedimentation, but these have not been confirmed (MacKay 2017). Future infrastructure or damming projects on the Thanlwin and Sittaung Rivers might lead to loss in sediment supply that exacerbate the impacts of extreme flooding and storm events (Wongthong and True 2015).

Impacts to threatened species: The global SBS population has declined by 88% since 2008, thought to be due mainly to the destruction of tidal wetlands all over Southeast Asia and East Asia, as well as a variety of threats throughout its extensive range (BirdLife International 2017, BANCA 2017). One such threat is shorebird hunting, and possibly accidental capture in fixed fishing nets, in the GoM (BANCA 2017). Hunting has declined due to BANCA’s work with communities. However, elimination of hunting and accidental capture, as well as protection of SBS habitat, remain urgent priorities for this Critically Endangered species (BANCA 2017, BirdLife International 2017, Htin Hla and Eberhardt 2011).

Anecdotal reports indicate that Irrawaddy dolphins and finless porpoises are accidentally captured in fishing gear, which is a major threat for these species in other locations where they exist. More research is needed to improve understanding this threat, as well as other species of possible conservation concern in the GoM.

Decline in fisheries catch: Fishers in the GoM report a 50%-90% decline in catch over the last decade. This is likely due to illegal fishing and overfishing and has resulted in increasingly intensive fishing effort. Without action to control fishing effort and illegal fishing, fish catch and the coastal economy will continue to further decline, with serious impacts for GoM's communities, with increased poverty potentially leading to large-scale population migration. Fisheries operations also struggle with limited access to credit and with labor shortages. As fish catch decreases, small-scale fishers are being forced to look for work in other sectors.

Low productivity and limited livelihood options: Livelihood activities, from agriculture and fisheries, face several difficulties. As reported by local farmers, agricultural yields are limited by degradation of soil fertility, unfavorable weather and flooding, limited labor force, and need for better equipment (Khin Tar Tar et al. 2015). Proximity to the sea results in saltwater intrusion, especially in the dry season, resulting in low productivity and even the total loss of paddy fields (Theingi Myint, 2015). Fishery production is constrained by seasonal impacts on fish supply, access to the sea, and conditions for drying products, with most operations occurring in the dry season (mid-October to April or May) (Salagrama 2017, Wongthong and True 2015). In most cases, poor coastal households face a shortage of livelihood activities during the wet season. There are also no farming activity opportunities between rice transplanting and the harvest.

Erosion and Sedimentation: Substantial erosion in the upper Gulf is causing the loss of agricultural land and villages in Bago Region, with land accretion occurring on the Mon State side. Recent work (Tun Tun Thein, 2016) has systematically documented this erosion based on 20 years of Landsat satellite images. This shows a westward shift of the shoreline by 18 km. Over 37,000 ha of farm land in Bago have been washed out, impacting agriculture-based livelihoods. Over 10 villages have been washed out and 22 are in danger, representing about 30,000 potential Internally Displaced Peoples (IDPs). On the Mon side, about 27,000 ha of new land has been deposited. Many IDPs from the Bago side have migrated to the Mon side. This erosion has been observed to change over the last 36 years, switching between the Bago side and the Mon side over the years. Other reported changes include the silting up of the river channel between the two bridges and down to the river mouth. Unfortunately, there is a lack of systematic data on historical patterns of erosion and sedimentation before the 1980s. Thus, it is difficult to know whether the catastrophic erosion in Bago, and other changes, are part of a natural cycle, or whether it reflects long-term changes to the river's flow. More needs to be understood about this cycle in order to guide adaptation to erosion.

2.2 Opportunities for the effective management of the GoM



3rd Consultation Meeting for the Gulf of Mottama Coastal Natural Resource Management Plan_ Photo © Min Nyan Seik/KMCO-GoMP

Despite these threats, this is an opportune time for establishing effective management of the GoM's coastal natural resources. Changes in the government, including new policies and committees relevant to coastal natural resource management, are an opportunity to work with the government to shape an improved, integrated approach to management. The new government that took power in May 2016 has demonstrated its strong commitment to support fundamental improvements in natural resource management in the GoM, as evidenced by the designation of the GoM Ramsar site and cooperation with the GoMP in the formation of National Wetland Committee, and the newly-formed Coastal Resource Management Committees (CRMCs) at the Union as well as the state and region level. Additionally, fisheries policies are going through important changes, with freshwater fisheries policies being decentralized to the state and region level, opening up greater possibilities for co-management.

Addressing these threats requires strategic efforts and partnerships among communities, government at various levels, and NGOs, academic institutions, and the private sector. The government's expressed commitment to natural resource management represents an opportunity to establish strong working relationships among stakeholders, as well as appropriate policies and laws along with more effective enforcement mechanisms. This commitment also comes from Mon State and Bago Region governments, as well as village and township levels, and the private sector. Recent management measures developed at township and village levels demonstrate strong potential for management at all levels. A notable example is the pilot project on fisheries co-management, including a conservation zone, in Thaton; this will be a valuable model for management in the rest of the GoM.

Another significant opportunity is the strong interest on the part of research institutions, namely Mawlamyine University, Bago University, and Yezin Agriculture University, in capacity-building for their research programs and in contributing research efforts to the management of the GoM. This includes a MOU between Mawlamyine University, IUCN, and Prince Songkla University in Thailand for research and training exchanges.

Market chain opportunities include engagement of the private sector, such as the Myanmar Fisheries Federation, as well as proximity to markets in Yangon and Thailand. A specific opportunity is birdwatching tourism, recommended in the National Species Action Plan for the Conservation of Spoon-billed Sandpiper in Myanmar 2017-2020 (BANCA, 2017). BANCA has worked with some communities to establish Local Conservation Groups, who have acted as guides for birdwatching tours in the GoM. Though the number of jobs would be small and seasonal, this additional income and partnership with conservation would contribute to the awareness and capacity of communities for natural resource management.

The GoMP operates in a context of growing interest in coastal natural resource management in Myanmar, including work by experienced local and international NGOs and CSOs with valuable expertise. This has led to the formation of the Myanmar Fisheries Partnership, a platform for sharing information and for coordination across these projects. Implementation of this Management Plan will coincide with similar efforts, allowing for possible synergies across organizations working to establish effective co-management of coastal and aquatic resources in Myanmar.

GOVERNANCE CONTEXT

SECTION 3. CURRENT GOVERNANCE AND MANAGEMENT MECHANISMS

The governance context for coastal natural resource management in Myanmar is dynamic, with great opportunities for improving coastal natural resource management through new and/or adapted institutions, policies, and laws. Diverse institutions and stakeholder groups are involved in the management of the GoM's natural resources (Annex 1).

3.1 International agreements & recognition

Through its importance for biodiversity and the conservation on threatened species, proper management of the GoM contributes to Myanmar's commitment to global environmental agreements, such as the Convention on Biological Diversity. The GoM includes a Ramsar site and is an East Asia-Australasian Flyway Partnership network site.



Myanmar 4th Ramsar Site launching event, Mon State_Photo © BANCA

Ramsar designation: The Ramsar Convention provides the framework for national action and international cooperation to sustainably manage wetlands. The Ramsar Convention aims to promote the wise use of wetland habitats – particularly those recognized as Ramsar sites, or wetlands of international importance. Myanmar ratified the Ramsar Convention in 2005, signaling a commitment to the sustainable management of its wetlands.

In May 2017, the northern part of the GoM was designated as Myanmar's fourth Ramsar site, after five years of efforts by Royal Society for Protection of Birds, BirdLife International, and the Spoon-Billed Sandpiper Task Force, including BANCA. The process involved extensive consultations with local communities, the Mon State government, and the Forest Department acting as the national Ramsar focal point. The designation is anticipated to expand to three more townships in Mon State (Thaton, Paung, Chaungzon), and to Bago and Yangon Regions.

The Myanmar government is committed to put in place a management framework for this Ramsar site. The designation of the GoM Ramsar site is of special significance because it is the first in Myanmar that is outside a legally designated protected area. This sets an important precedent for Myanmar's many other wetlands of global importance that merit Ramsar status but are not in designated protected areas.

The East Asian-Australasian Flyway Network site designation: The East Asian-Australasian Flyway (EAAF), which encompasses Myanmar, is one of nine major migratory waterbird flyways around the globe. The EAAF Partnership (EAAFP) seeks to advance the conservation of migratory waterbirds in the EAAF while addressing social and economic needs of communities dependent upon wetlands and waterbirds. EAAFP works to develop a network of flyway sites, enhance communication, awareness and research, and build capacity for management. In July 2014, the Government of Myanmar became a Partner of EAAFP. In recognition of its importance for migratory waterbirds, including the critically endangered SBS, an area covering 195,000 hectares of the GoM has been designated as an EAAFP Flyway Network Site. This could be used to strengthen awareness of the international value of the GoM.

3.2 Governance of Coastal Natural Resources

Policies and institutions specific to the management of Myanmar's coastal resources include:

Coastal Resource Management Committee (CRMC): A major milestone in Myanmar's natural resource management is in November 2016, establishment of the National Coastal Resource Management Committee (CRMC), as well as the mandate to establish such committees at the State and Region level. They will develop policy for managing coastal natural resources and represent a significant opportunity for inter-sectoral management of the GoM.

National Wetland Committee: To effectively implement management of Ramsar sites and other wetlands, National Wetland Committee (NWC) was formed in 2016. The National Wetland Policy is currently being developed. The work of the NWC should be closely coordinated with the CRMC, and the National Wetland Policy will be a key instrument in the implementation of this Management Plan.

Fisheries and Co-management Legal Framework: Fisheries in Myanmar are categorized as marine (offshore and inshore) and freshwater fisheries, covered by the Myanmar Marine Fisheries Law and the Freshwater Fisheries Law, respectively. As of the 2008 Constitution of the Union of Myanmar, freshwater fisheries management has been decentralized to State and Region governments. Freshwater fisheries laws have been developed in Ayeyarwaddy Region (2012) and Rakhine State (2014), and are being developed in Mon State and Bago Region.

An important development for co-management was the Community Forestry Instructions, issued by the Forest Department in the mid-1990s. This guides co-management of resources in forest systems, including mangroves. Co-management of fisheries is currently being developed at the State/Region level through focused, multi-stakeholder projects; there are no policy provisions yet for fisheries co-management at the national level.

3.3 Governance of the Gulf of Mottama's coastal natural resources

Institutions and policies more specific to the Gulf of Mottama are currently being adapted and developed, particularly at the local level, but also at the State and Region level.

Mon State and Bago Region Coastal Resource Management Committees (CRMCs):

These committees are newly formed (as of early 2018) to oversee development and implementation of coastal natural resource management policy in their respective areas. They will play a critical role in coordinating the implementation of this Management Plan. The Bago CRMC is officially named the "Sittaung Estuary Management Committee." Currently, they are composed of government officials at various levels, from Ministries, Departments, and other offices (Annex 2). The possibility of changing this to a more diverse group of stakeholders is being explored.

Mon State and Bago Region Wetland Management Committees (WMCs): Formed in 2016 and 2017, respectively, these committees included representatives from relevant Ministries and Departments, as well as local universities (Mawlamyine and Bago Universities) and the private sector (Myanmar Fisheries Federation). Given the recent development of State and Region CRMCs, and significant overlap in composition and areas of work, the role of WMCs will transition into roles taken on by CRMCs and related working groups and task forces.

Mon State and Bago Region Freshwater Fisheries Laws: Fresh water fishery laws of both Mon State and Bago Region were amended through several consultations with diverse stakeholders and the new laws are endorsed by State and Regional Hlutaw in March 2018. Currently, Fishery By-laws of both Mon State and Bago Region are under developing process by State and Regional Department of Fishery and if after this process, the resulting full packages of laws (Law with By-law) will play an important role in fisheries co-management in the GoM.

3.4 Village, District, and Township-level institutions and policies

To achieve co-management, governance must include local stakeholders. Local capacity for management and links between local entities and the Mon and Bago CRMCs must be strengthened. Through the GoMP and previous work by BANCA, groups related to environmental management have been formed or supported at the village and township level:

Village Development Committees (VDCs): act as the village implementation unit for the GoMP's initiatives in each project village in Bago and Mon, with village representatives liaising with the project. These include livelihoods groups – Fisheries Group, Agriculture Group, and Income Generating Activities Group. Some VDCs were formed through the GoMP, and some were formed during the previous government as Village Development Support Committees.

Local Conservation Groups (LCGs): were developed with BANCA assistance to support shorebird conservation, including monitoring of shorebirds as well as illegal fishing. The groups are voluntary and have been established in known bird hunting sites. These will be incorporated in VDCs.

Township Fishery Development Associations (FDAs): serve as communication platforms for Fisheries Groups from local villages and they take the leading role on dealing with Governmental Departments and different agencies. Fishing communities, through FDA, address the communities' issues and advocate them to the related departments such as DOF, GAD, etc. Similar associations for farmers will also be established in the near future.

Thaton Township Co-Management Area and Plans, Mon State: The first fishery co-management zone including 500 acres of crab conservation area in Mon State was declared by Mon State Government in the village of Aung Kan Thar in Thaton Township, in late 2017. This was a result of collaboration between GoMP, village fishers, Thaton FDA, DoF (state and district), and Myanmar Fisheries Federation. The primary focus will be tackling the problem of illegal fishing in the area. Currently, fisheries co-management plans for this area and for two other Mon State townships are being drafted with the support of NAG as part of GoMP.

3.5 Supporting Institutions

Involvement of the private sector is hugely important. The Myanmar Fisheries Federation (MFF) has been involved in multiple consultations on policy and Management Plan development. Other key groups include academia, namely Mawlamyine University, Bago University, and Yezin Agriculture University, as well as universities from other countries – including HAFL in Switzerland and Prince Songkla University in Thailand – and local and international experts. Various NGOs, local and international, have worked for sustainable management in the GoM, or have plans to begin such work in the near future. Beyond the GoMP partners, these include: Wildlife Conservation Society, Environmental Defense Fund, Vision Fund, and Point B Design + Training, an NGO based at Mawlamyine University.

THE MANAGEMENT PLAN: PRINCIPLES, OUTCOMES AND OUTPUTS, AND IMPLEMENTATION

SECTION 4: OPERATIONAL DESCRIPTION

This Management Plan establishes the direction for the long-term management of the GoM's natural resources, integrating communities and governance institutions. The overarching vision of the Plan is that **the unique biodiversity of the Gulf of Mottama is conserved and sustainably developed in order to benefit human communities that depend on it**. This plan identifies three major, long-term Outcomes that contribute to this vision, corresponding with livelihoods, natural resource management and biodiversity conservation, and governance. These three components are interlinked and coordinated efforts to communicate and collaborate across initiatives targeting these components will promote holistic management of the GoM.

The major role of this Plan is to guide management actions, providing a framework for relevant committees and working groups at State/Region, District/Township, and village levels. Moving from this Plan to effective management of the GoM will require development and implementation of focused action plans and programs. This Plan is meant to be an enduring, but adaptable, guide for the management of the GoM; it should be adapted as new information becomes available, as monitoring and review occurs, or as legislation changes.

4.1 Guiding Principles

This Management Plan embraces a set of principles which should guide sustainable, effective, and equitable management of the Gulf of Mottama:

Ecosystem-based approach to the wise use of wetlands: This approach considers the broad suite of biological, physical, and human elements in an ecosystem, and the interactions among these elements. "Wise use" is a central principle of the Ramsar Convention, which means "...the maintenance of [wetlands'] ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development." This Management Plan reflects system-wide perspectives for the wise use of the rivers, intertidal mudflats, coastal zone, and floodplains of the GoM, for nature conservation and coastal natural resource management (CNRM) and for sustainable development and long-term livelihoods.

Livelihood framework and markets for the poor: A thriving rural economy is crucial for improving livelihoods of disadvantaged women and men. Sustainable agriculture, fisheries, and aquaculture, including more diversified, productive, and resilient systems, should provide enhanced food security and incomes. Diversified skills and opportunities in off-farm livelihoods are also important. Livelihood strategies need to be interlinked with market systems in order to be economically viable. Such market systems and business opportunities should provide reliable access to quality services and markets.

Co-management approach: Equitable and sustainable management of the natural resources of the GoM, particularly fisheries resources, is to be achieved through a process of co-management. Co-management is a cooperative arrangement in which user groups and the government share responsibility for management, including decision-making, implementation, and enforcement.

Inclusiveness, Gender, and Social Equity: To promote a true sense of ownership of the management process, and to ensure benefits to the most vulnerable population, the management of the GoM should be inclusive, with equitable representation and active participation of stakeholder groups throughout the management process. This encompasses gender inclusiveness; women must be meaningfully included in the management process to ensure that their needs, rights, and contributions are fully valued. The benefits and costs of managing the GoM should not be concentrated only in certain stakeholder groups, but should be distributed in a more equitable manner. Capacity building can prepare stakeholders for active participation in and leadership of management processes. Monitoring and evaluation should ensure that positive and negative impacts from management are not disproportionately borne by any group of stakeholders.

Conflict sensitivity: To ensure that the management of the GoM does not exacerbate underlying social tensions or contribute to conflict, it is important to integrate conflict sensitivity into management activities through a “do no harm” approach. An inclusive approach to management that involves diverse stakeholders (outlined above) can contribute to conflict sensitivity, by bringing more representative perspectives to decision-making and implementation. It is critical that monitoring and evaluation of management activities includes consideration of the social impacts of those activities, including impacts on relationships and tensions within and across stakeholder groups. Similarly, the planning of all activities should carefully consider the potential for unforeseen impacts on conflict. Conflicts needing resolution should be approached using Conflict Sensitive Project Management.

4.2 Outcomes and Outputs

This management plan is structured around three Outcomes (Figure 3). Each Outcome includes three Outputs. Achieving these outputs and outcomes will require well-planned, thoughtfully targeted, and well-coordinated activities (see Tables 1, 2, and 3). Many of these activities will be linked to activities under other Outputs and Outcomes.

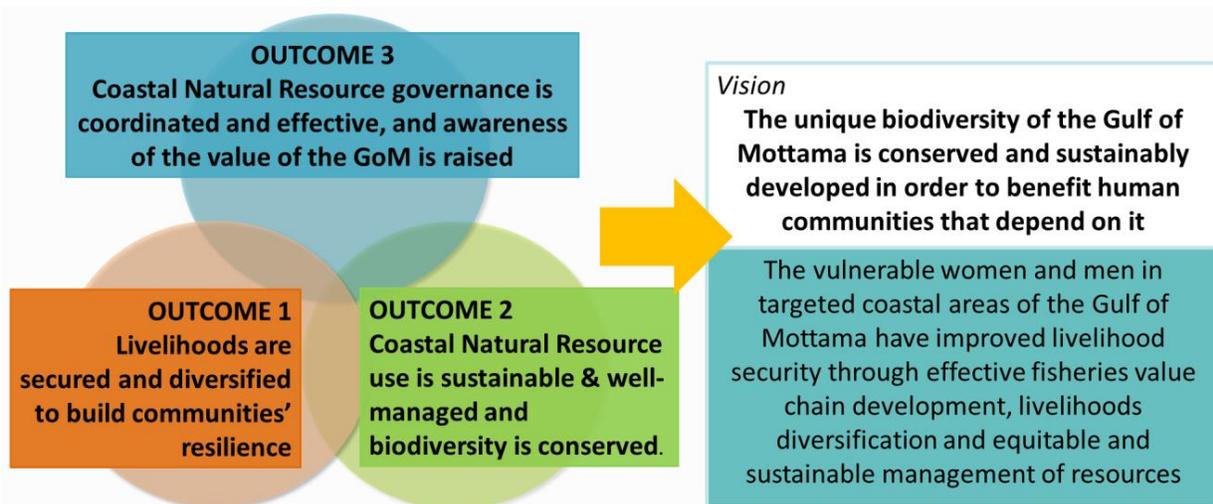


Figure 3. The three Outcomes that will contribute to achieving the visions for the Gulf of Mottama's natural resources and communities.

Outcome 1: Livelihoods are secured and diversified to build communities' resilience

Improving livelihoods and introducing new livelihood options and skills can make communities more resilient to the challenges of declining fisheries, low input and low output agriculture, limited off-farm opportunities, and the effects of climate change and natural disasters on livelihoods. This will allow them to better manage their natural resources. This Management Plan aims to strengthen the most vulnerable groups in the GoM's communities through fisheries management, improvement of value chains, support to on-farm and off-farm livelihoods, access to affordable credit and other support for small and medium enterprises (SMEs), access to freshwater, improved infrastructure and waste management, and Disaster Risk Reduction.

Table 1. Example activities under Outputs 1.1, 1.2, and 1.3 for Outcome 1

OUTCOME 1 Livelihoods are secured and diversified to build communities' resilience	
Output 1.1 Fisheries and on-farm livelihoods improved and/or diversified through skills and market system development	<ul style="list-style-type: none"> • Skills training and introduction of improved crop varieties • Improved market chain for agricultural and fisheries products • Developing aquaculture • Improved access to micro-credit and loans • Improved freshwater supply and transportation infrastructure
Output 1.2 Off-farm livelihoods options provided through skills and market system development	<ul style="list-style-type: none"> • On-the-job training, including development of business plans • Support for development of SME • Linking graduates from training programs to job opportunities • Providing information to future international migrants for awareness of rights and job opportunities
Output 1.3 Promote community-based disaster risk management (CBDRM) planning and adaptation	<ul style="list-style-type: none"> • Mapping high-risk areas for erosion • Developing Shoreline Erosion Adaptation Plans at State/Region level • Including Disaster Risk Management strategies in Village Action Plans • Support internally displaced persons on retreat, relief, and resettlement

Output 1.1 - Fisheries and on-farm livelihoods improved and/or diversified through skills and market system development: For agriculture and fisheries livelihoods, improving yields and market chains are important for improving livelihoods. This includes improved fisheries markets and processing, improved farming and aquaculture techniques, and introduction of improved crop varieties. Research for this will be carried out by HAFL and Yezin Agriculture University. Specific activities include developing productive aquaculture practices and promoting more resilient crop strains and organic agriculture.

Output 1.2 - Off-farm livelihoods options provided through skills and market system development: This focuses on developing vocational, entrepreneurial, and life skills in communities, especially for youth and marginalized groups. The goal is to improve income generation for these groups, including facilitating access to off-farm activities and employment in other sectors. Since migration is a common livelihood strategy, it will be important to support skills development and knowledge of migrant workers' rights, to prepare migrants for safe migration and/or offer alternative skills training to find employment locally.

Output 1.3 - Promote community-based Disaster Risk Management planning and adaptation: Disaster Risk Management (DRM) is an important issue in the GoM. Significant erosion is a serious hazard for communities along the coast of Bago. Other hazards include saltwater intrusion into agricultural land, flooding, coastal erosion, and water scarcity. Community-based Disaster Risk Management will be developed, and collaboration with government will be strengthened to improve planning for Disaster Risk Management. Through community-based DRM plans, local actors will be enabled to better deal with challenges related to local disaster risks (erosion, floods, droughts, storms etc.) through increased awareness, adaptation measures, and better preparedness of local first responder groups.

Outcome 2: Coastal natural resource use is sustainable and well-managed, and biodiversity is conserved

The collection, analysis, and application of knowledge about the GoM's ecosystems and communities is necessary for effective and equitable management of the coastal natural resources (including critical habitat and key species) of the Gulf of Mottama.

Table 2. Example activities under Outputs 2.1, 2.2, and 2.3 for Outcome 2

OUTCOME 2 Coastal Natural Resource use is sustainable, well-managed and biodiversity is conserved.	
Output 2.1 Produce and use knowledge for effective CNR Management and biodiversity conservation	<ul style="list-style-type: none"> • Research to identify important species and habitats • Socioeconomic research about fisheries • Research training at local universities • Participatory research so that communities do research
Output 2.2 Practice inclusive co-management of CNR at village, township, district, State/Region levels	<ul style="list-style-type: none"> • Development of local conservation strategies, including fisheries co-management plans • Meetings and consultations among stakeholders • Strengthened patrol and enforcement teams against illegal practices
Output 2.3 Promote Ecosystem-based DRM to increase resilience in communities	<ul style="list-style-type: none"> • Evaluating how mangroves might protect the coast from erosion • Evaluating community knowledge about the Disaster Risk reduction role of mangroves

Output 2.1 - Produce and use knowledge for effective coastal natural resource management and biodiversity conservation: To manage natural resources, good scientific research about these resources is needed. Research will focus on important species, habitats, and natural resources, and how they are affected by human activities. This research will guide management of resources at all levels. Building capacity of local universities, relevant government departments, and community members for research, including participatory research, will help ensure long-term monitoring of the GoM's ecological and social conditions. Such training will include programs through Mawlamyine and Bago Universities, and the new Fisheries Training Centre.

Output 2.2 - Practice inclusive co-management of coastal natural resources at the village, township, district, and State/Region level: To improve local management, capacity will be built so that villages can be actively involved in decision-making and implementation of coastal natural resource management. This will include active participation of women in management. Cooperation between village, township, and State/Region level, as well as private sector, NGOs, and universities will be strengthened so all can work together. Specific conservation measures for species (e.g., Spoon-Billed Sandpiper) and fisheries management will be developed in the context of this Management Plan. Capacity-building will promote skills and connections for co-management and for surveillance and enforcement at the village level, strengthening cross-level cooperation to link enforcement authority with village-level monitoring of illegal resource use activities, and training in monitoring and patrolling systems (including SMART patrol techniques). Ongoing efforts to develop co-management at a demonstration site in a village in Thaton, Mon State, will serve as an opportunity to learn lessons to be applied to further sites.

Output 2.3 - Promote ecosystem-based Disaster Risk Management to increase resilience in communities: Considering that functional coastal ecosystems contribute to reducing small-scale erosion, flooding and salinization problems, it will be important to create synergies between coastal resource management and DRM, through ecosystem-based DRM. Such efforts will collect, synthesize, and integrate DRM information, to assess Disaster Risk Reduction (DRR) role or value of the GoM's ecosystem services, particularly mangroves in the southern part of the GoM.

Outcome 3: Coastal natural resource governance is coordinated and effective, and awareness of the value of the GoM is raised

To manage the natural resources of the Gulf, governance institutions at all levels should have stronger capacity to work together and to develop, implement, and enforce policies and laws in a multi-stakeholder approach. This outcome focuses on building capacity for various institutions. Management activities should actively include women and vulnerable groups. It also includes development and adaptation of policies and laws that support implementation of the Management Plan. Effective management will require raising awareness of the unique value of the GoM, sharing knowledge through various platforms and media actions to diverse groups, including the general public. Clear roles and responsibility, accountability, and monitoring and evaluation are needed to underpin good governance at all levels and to ensure that activities are in accordance with the Management Plan's Guiding Principles.

Table 3. Example activities under Outputs 3.1, 3.2, and 3.3 for Outcome 3

OUTCOME 3 Coastal Natural Resource governance is coordinated and effective, and awareness of the value of the GoM is raised	
Output 3.1 Strengthened capacities of governance institutions	<ul style="list-style-type: none"> • Support governance bodies from all levels • Regular meetings and coordination among stakeholders • Develop Gender and Inclusive Governance Guidelines • Build capacity for continued coordination of management of the Gulf
Output 3.2 Adapted and enforced Policies and Laws on coastal natural resource management	<ul style="list-style-type: none"> • Develop a platform to communicate to decision-makers • Support development and adaptation of policies and laws • Build capacity among government staff for implementing policies • Support training for enforcement of natural resource laws
Output 3.3 Improved awareness and knowledge-sharing on the unique values of the GoM promoting behavior change and co-management	<ul style="list-style-type: none"> • Education and awareness events in Gulf townships • Communicating information on the Gulf to communities and the public through the internet, newsletters, and the media • Develop a participatory Monitoring and Evaluation system

Output 3.1 - Strengthen capacities of governance institutions: Management of the Gulf will require collaboration between Bago Region, Mon State, and Yangon Region, and between villages, townships, and State/Region levels. Each institution should have strong capacity for their role in management and collaboration, including the Coastal Resource Management Committees, multi-stakeholder working groups, township Fisher and Farmer Development Associations, and village groups. Additionally, these institutions can learn from exposure to experiences in co-management from other sites through within-country and international knowledge exchange visits.

Output 3.2 - Adapted and enforced policies and laws on coastal natural resource management: To truly implement the Management Plan, appropriate policies and laws must be developed and/or adapted to support Management Plan outcomes and principles. Part of this process will be to identify and prioritize policies and laws relevant to the integrated management of the GoM (including access and use of existing and new land) through review, multi-stakeholder consultations and dialogues. The newly formed State/Region CRMCs will be formulating their policies in 2018 – an opportunity to align these policies with this Plan. Enforcement of laws will be supported and strengthened through capacity-building for enforcement, including trainings and development of township-level enforcement plans and logistical support for enforcement bodies. In order to ensure that research findings and community-level management plans are considered in higher-level decision-making, a decision support platform that communicates this information to decision-makers is needed.

Output 3.3 - Improved awareness and knowledge-sharing on the unique values of the GoM promoting behavior change and co-management: Awareness and knowledge-sharing are critical, cross-cutting elements of the Management Plan. The communication of information is vital for appropriate decision-making, development of management plans, and enhancing support for and participation in management activities, particularly through raising awareness of ecosystem services. As such, awareness-raising events will be instrumental in implementation of the Management Plan, including CEPA (Community, Education, Participation, Awareness) campaigns, special events, and local-level knowledge-sharing platforms and materials. To guide these efforts, strategic plans should be developed for awareness-raising campaigns and media action. These awareness-raising and knowledge-management efforts should result in the value of GoM being recognized by communities, the broader public, and decision-makers. Another important area of knowledge is monitoring and evaluating the effectiveness of Management Plan implementation. Participatory efforts could contribute greatly to this evaluation; building local capacity for participatory monitoring and evaluation should be guided by strategic plans to be a productive part of GoM management.

SECTION 5: IMPLEMENTATION

5.1 Implementation process

Implementing this Management Plan will require a clear, functional governance structure through which institutions can effectively communicate and collaborate (Figure 6). Key roles and responsibilities (Table 4) will need to be taken on by these institutions. The GoMP implements its work through Annual Work Plans, within multi-year phases; similarly, implementation of the Management Plan should be carried out through yearly work plans and phases. The Management Plan's outcomes and outputs will be achieved through focused efforts, to be outlined in Annual Work Plans and specific action plans. Such plans should feed into the work plans of relevant Departments and other institutions, ensuring that implementation of this Management Plan is integrated into ongoing activities and duties. This will set the stage for sustained management.

Co-management is critically important to effective and equitable management of the GoM's resources. Involving diverse stakeholders will help ensure that the GoM is managed in a holistic manner that considers diverse ecosystem services, stakeholder needs, and ideas and approaches. This will necessarily involve institutions at the village, township, state/region, and Union level, in addition to important partnerships with the private sector. There must be functional linkages among all these institutions.

All of this requires oversight by a coordinating committee. The Mon State and Bago Region CRMCs will serve this role – they will be in charge of the implementation of this Management Plan. They recognize that this role should involve a multi-stakeholder institution. However, these CRMCs are currently almost entirely composed of government ministers, department directors, and officers. The possibility for amending the composition of these committees to include other stakeholder groups is being explored. Another option would be forming multi-stakeholder working groups linked to these committees, and/or multi-stakeholder CRMCs at the District/Township level.

While the CRMCs (and associated multi-stakeholder working groups, if formed) would coordinate and oversee implementation of the management plan, more focused technical task forces would be in charge of developing, coordinating, and implementing specific activities. These task forces would include representatives from stakeholder groups, including various ministries. The GoMP will work closely with these task forces for training and support for implementation activities.

Table 4. Summary of major responsibilities to be undertaken for effective implementation of this Management Plan

MAJOR RESPONSIBILITIES	
RESEARCH	Knowledge to guide management
COMMUNICATE KNOWLEDGE	To decision-makers, managers, communities, public
DEVELOPING POLICIES & REGULATIONS	From local to state/region level
CO-MANAGEMENT &	Partnerships between communities, government, and

LIVELIHOODS ACTIVITIES	private sector
PATROLLING & ENFORCEMENT	Seeing if people are obeying regulations, and using authority to penalize rule breakers
MONITORING & EVALUATION	The outcomes of management activities on communities and resources, and how to improve
CAPACITY BUILDING	Training in management and research skills for all relevant stakeholders
COORDINATION & UPDATING PLAN	Overseeing implementation of management plan, including resources needed for management activities, and adapting the plan as needed

The GoMP will work with stakeholders and entities from village to Union levels to promote and implement the Plan through its remaining phases (2018-2024), to support the establishment of governance structures, processes, and practices for the long-term management of the GoM. Key activities will focus on building capacity, platforms, and processes for sustained management efforts into the future. By building a strong foundation through its activities, the GoMP will help ensure that the Plan’s implementation will transcend the scope and timeline of the project.

5.2 Monitoring and evaluation

To ensure effective implementation of the Plan, as well as alignment with the Plan’s Guiding Principles, ongoing evaluation and adaptation of the Plan is necessary. This will allow for tracking of progress toward Management Plan outcomes and outputs, and other impacts of implementation activities. Participatory approaches to monitoring and evaluation would be especially important to ensure representation of diverse perspectives in the review as well as to build local capacity for monitoring and evaluation among the participants. CRMCs, or their Task Forces, will be responsible for overseeing the monitoring and evaluation process, and for adapting the Management Plan as needed.

It is recommended that evaluation comprises annual reviews and more in-depth, less frequent reviews of specific activities or issues. For example, evaluations specific to gender issues, or to social relationships and conflict within communities, would likely be needed in addition to large-scale assessments of management of GoM as a whole.

5.3 Funding strategies

The management of the GoM, particularly indicative activities that require capital inputs, will require additional funding apart from the GoMP. Ideally, several activities linked to the management of the GoM would, after initial start-up costs in terms of capital and effort, set processes into motion that can be more efficiently sustained over time. However, key activities will inherently require ongoing capital input (e.g., research, monitoring and patrol, meetings and other events), and assessment of the implementation of the Plan itself will also require inputs (e.g., for monitoring and evaluation). This highlights the need for management initiatives to consider training in grant writing and other important skills needed for procuring funding.

It will be critical to find new sources or reallocate existing resources for funding. This could include community-level funding, e.g., how communities might be able to develop finance mechanisms that do not require external input. Revolving funds in GoMP's project villages have been established; training in sustained management of these funds will be important.

Funding from State/Regional governments would not only be an important source of funding but would also demonstrate a strong commitment to sustained management of the GoM beyond the GoMP. Other possibilities include departments generating revenue through resource use permits/licenses that can then go toward management-related activities, eventual development of ecotourism, and funding from international organizations.

5.4 Long-term application of the Management Plan

To maintain the GoM's important natural resources and the well-being of its local communities, management must be guided by a long-term strategy that effectively addresses ecosystems, livelihoods, and governance. This Gulf of Mottama Coastal Natural Resources Management Plan outlines a framework for the long-term management for the GoM's coastal natural resources and strengthening of its communities. This Plan is meant to be enduring, but adaptable. Where required, it should be further developed and refined as new information becomes available, as monitoring and evaluation is carried out, and as legislation changes. Using this Management Plan as a guide, it is hoped that the governance bodies and other stakeholders of the Gulf of Mottama will work together into the future to ensure that "the unique biodiversity of the Gulf of Mottama is conserved and sustainably developed in order to benefit human communities that depend on it."

REFERENCES

Ansari ZA, Mehta P, Furtado R, et al. 2014. Quantitative distribution of meiobenthos in the Gulf of Martaban, Myanmar coast, north-east Andaman Sea. *Indian J Geo-Mar Sci* 43: 189–97.

Aye Moe. 2017. Analysis of the mud crab fishery in Bilin Township, Mon State (Masters by Research), Mawlamyine University, Myanmar.

BANCA. 2017. National species action plan for the conservation of spoon-billed sandpiper (*Calidris pygmaea*) in Myanmar 2017-2020 An output of a National Spoon-billed Sandpiper workshop, 17 January 2017, Mawlamyine, Myanmar (pp. 34): Biodiversity and Nature Conservation Association (BANCA).

BirdLife International. 2017. *Calidris pygmaea* (amended version of 2017 assessment). IUCN Red List of Threatened species.

Brewer, D., Hayes, D., Lyne, V., Donovan, A., Skewes, T., Milton, D., & Murphy, N. 2015. An ecosystem characterisation of the Bay of Bengal Commercial in Confidence Report to FAO for the Bay of Bengal Large Marine Ecosystem Project. (pp. 287). CSIRO, Australia.

Khin Tar Tar, Khin Chaw Myint, & Aung Myo. 2015. Baseline study on Community-led Coastal Management in the Gulf of Mottama Project. HELVETAS Swiss Intercooperation.

MacKay KT. 2017. Introduction and review of research on the Gulf of Mottama: Environment and Fishery. Community-Led Coastal Management in the Gulf of Mottama Project.

MacKay KT & Soe Min Oo. 2017. Illegal fishing with small mesh stake nets (Than Za Gar Pike) catching small fish: A case study. Community-Led Coastal Management in the Gulf of Mottama Project.

Maharjan, A., & Myint, T. 2015. Internal labour migration study in the dry zone, Shan State and the southeast of Myanmar (pp. 54): HELVETAS Swiss Intercooperation Myanmar.

MatAmin, A. R., Ahmad, F., Mamat, M., Abdullah, K., & Harun, S. 2015. Remote sensing of suspended sediment over Gulf of Martaban. *Ekológia (Bratislava)*, 34(1), 54-64.

Millennium Ecosystem Assessment (Ed). 2005. Ecosystems and human well-being: wetlands and water synthesis: a report of the Millennium Ecosystem Assessment. Washington, DC: World Resources Institute.

Ramaswamy, V., Rao, P. S., Rao, K. H., Thwin Swe, Rao, N. S., & Raiker, V. 2004. Tidal influence on suspended sediment distribution and dispersal in the northern Andaman Sea and Gulf of Martaban. *Marine Geology*, 208, 33-42.

RIS. 2017. Ramsar Information Sheet: Myanmar - Gulf of Mottama.

Robinson, R. A. J., Bird, M. I., Oo N W, Hoey T.B, Aye M M, Higgitt D.L., . . . Lhaing Win Swe. 2007. The Irrawaddy river sediment flux to the Indian Ocean: the original nineteenth-century data revisited. *Journal of Geology* 115, 629–640.

Salagrama, V. 2015. Fisheries Value Chain Assessment: Opportunities for strengthening the position of small scale fishers in the value chain: NETWORK ACTIVITIES GROUP (NAG).

Soe Min Oo, & MacKay, K. 2017. Small-scale wild fish aquaculture in Myanmar: A preliminary report from Bago Region Network Activities Group

Thazin Htet. 2017. Fisheries analysis of the Kyeik Hto Township based medium sized boat fishery in the Gulf of Mottama. (Masters), Mawlamyine University, Myanmar.

Theingi Myint. 2015. Non-fishery Value Chain Study in South East Region, Myanmar Market Makers Project: Swiss Agency for Development and Cooperation (SDC).

Tint Swe. 2011. Biology and economics of fishery resources caught by stationary bagnets along the coast of Mon State. (PhD), University of Mawlamyine, Myanmar.

Tint Wai, Win Ko Ko, Moe Moe Myint, Zaw Linn Htun, Thaw Phyo Swe, & Tun, T. 2014. A rapid assessment of fish and fisheries information in a part of east coast of Gulf of Mottama (pp. 16): BANCA.

Whitty, T. S., Wint Hte, Yin Yin, & Aung Naing Soe. 2017. Social potential for mud crab co-management in the Gulf of Mottama: Small-scale & Artisanal Fisheries Research Network, Center for Marine Biodiversity and Conservation, Scripps Institution of Oceanography

Wongthong P & True J. 2015. Updated situation analysis of the Gulf of Mottama, based on the rapid socio-ecological assessment.

Wood AP & Halsema GE van (Eds). 2008. Scoping Agriculture, Wetland Interactions: towards a Sustainable Multiple-response Strategy. Rome: Food and Agriculture Organization of the United Nations.

Zöckler C, Delany S, & Barber J. 2013. Sustainable Coastal Zone Management in Myanmar. Arc-Cona Ecol Consult Flora Fauna Int 60.

ANNEX

Table 1. Institutions that have been involved, or have developed plans to be involved in the near future, in management of the Gulf of Mottama, include:

COMMITTEES	Coastal Resource Management Committees (CRMCs) National Wetland Committee (NWC)
GOVERNMENT Ministries, Departments, and other entities	Mon and Bago Chief Ministers Ministry of Natural Resources and Environmental Conservation (MONREC) <ul style="list-style-type: none"> • <i>Forest Department (FD)</i> • <i>Environmental Conservation Dept. (ECD)</i> Ministry of Agriculture, Livestock, and Irrigation (MOALI) <ul style="list-style-type: none"> • <i>Dept. of Fisheries (DoF)</i> • <i>Dept. of Agriculture (DoA)</i>

	<ul style="list-style-type: none"> • <i>Dept. of Rural Development (DRD)</i> • <i>Dept. of Irrigation and Water Resources Management</i> • <i>Dept. of Farm Land Management and Planning</i> <p>Ministry of Social Welfare, Relief and Resettlement</p> <ul style="list-style-type: none"> • <i>Dept. of Disaster Management (DDM; former Relief and Resettlement Dept.)</i> <p>Ministry of Home Affairs</p> <ul style="list-style-type: none"> • <i>General Administrative Department (GAD)</i> <p>Ministry of Hotels and Tourism</p> <ul style="list-style-type: none"> • <i>Dept. of Hotel and Tourism Management</i> <p>Ministry of Planning and Finance</p> <p>Ministry of Transport and Communications</p> <ul style="list-style-type: none"> • <i>Dept. of Water Resources and River Development</i> <p>Port Authorities</p> <p>Parliament</p>
LOCAL GROUPS	<p>Fisheries Development Associations (FDAs; township)</p> <p>Farmer Development Associations (township)</p> <p>Village Development Committees (VDCs)</p> <p>Local Conservation Groups</p>
PRIVATE SECTOR	<p>Myanmar Fisheries Federation (MFF)</p> <p>Rice Production and Selling Association</p> <p>Microfinance Institute (MFI)</p>
RESEARCH	<p>Mawlamyine University</p> <p>Yezin Agriculture University</p> <p>Bago University</p> <p>The School of Agricultural, Forest and Food Sciences (HAFL) (Swiss)</p> <p>Prince Songkla University (Thai)</p> <p>International experts</p>
INGOs, NGOs, CSOs	<p>GoMP (SDC, HELVETAS, NAG, IUCN, BANCA)</p> <p>Wildlife Conservation Society & Environmental Defense Fund</p> <p>Point B Design + Training</p> <p>Vision Fund</p>

Table 2. Environmental policy and strategy overview

National development framework	<p>Myanmar Agenda 21 (1997)</p> <p>National Sustainable Development Strategy (NSDS) (2009)</p> <p>National Comprehensive Development Plan (NCDP) (2011-2030)</p> <p>Framework for Economic and Social Reform (FESR) (2013)</p> <p>National Biodiversity Strategy and Action Plan (NBSAP) (2015-2020)</p> <p>REDD+ Strategy (2016)</p>
---------------------------------------	---

	<p><i>Myanmar Climate Change Strategy and Action Plan 2016-2030 (drafted)</i> <i>Environmental Strategic Framework (expected 2018)</i></p>
<p>Supporting policy and planning framework</p>	<p>Law Relating to Aquaculture (1989) Myanmar Marine Fisheries Law (1990, amended 1993) Freshwater Fisheries Law (1991) Forest Law (1992) National Environment Policy (1994) Law on Protection of Wildlife and Conservation of Natural Areas (1994) Forest Policy (1995) Forest Rules (1995) Community Forest Instructions (1995) Protection of Wildlife and Protected Areas Rules (2002) Water Resources and Rivers Conservation Law (2007) Myanmar Constitution (2008) – Articles 45 and 390 Myanmar Action Plan on Disaster Risk Reduction (MAPDRR) (2009-2015) and Myanmar Action Plan on Disaster Risk Reduction, Preparedness, Relief and Rehabilitation (2012 – revisited the previous MAPDRR) Environmental Conservation Law (2012) National Adaptation Program of Action to Climate Change (NAPA) (2012) Environmental Conservation Rules (2014) Myanmar Rice Sector Development Strategy (2015) Environmental Impact Assessment Procedures (2015) Environmental Quality Guidelines (2015) Agriculture Policy (2016) <i>Agricultural Development Strategy and Investment Plan (Drafted as of September 2017)</i> <i>National Wetland Policy (in progress as of November 2017)</i> <i>Mon State Freshwater Fisheries Law (in development)</i> <i>Bago Region Freshwater Fisheries Law (in development)</i> <i>National Climate Change Policy (in development)</i> Biodiversity and Protected Areas Conservation Act (declared 2018) <i>National Environmental Policy (expected 2018)</i></p>
<p>Relevant treaties/agreements</p>	<p>United Nations Framework Convention on Climate Change (UNFCCC) (Ratification 1994) Convention on Biological Diversity (CBD) (Ratification 1994)</p>

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Ratification 1997)

United Nations Convention to Combat Desertification (UNCCD) (1997)

Hyogo Framework for Action (HFA) (2005)

Kyoto Protocol to the Convention on Climate Change (Ratification 2003)

ASEAN Multi-Sectoral Framework on Climate Change and Food Security: Agriculture and Forestry toward Food Security (2009) Ramsar Convention (2005)

The East Asian-Australasian Flyway Partnership (EAAFP) (2014)

