



Report on Assessment of Potential Community Forests in the Gulf of Mottama

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Gulf of Mottama Project
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1. Executive Summary

The Gulf of Mottama (GoM) is one of the world's most important and distinctive intertidal wetland systems and is also characterized by sediment redistribution, erosion, and accretion on a large scale. To safeguard the GoM's natural resources and the well-being of its local communities, management needs to focus on ecosystems, livelihoods, and governance. This presents a remarkable opportunity to develop effective natural resource management for the Gulf. Of different natural resources, mangroves play an important role in alleviating the adaptability of communities for climate change and disasters. Recognizing the paramount functions of mangroves, the Gulf of Mottama Project (GoMP) is supporting establishment of Community Forests (CFs) with active participation of communities not only to protect the ecosystems in the Gulf but also to adapt for the coastal communities to the changing climate.

This study assesses potential CF sites in the GoM by integrating various methods such as analysis of satellite images using Remote Sensing and Geographic Information System (RS/GIS) technique, Focus Group Discussion (FGD), field assessment and secondary information. The study area is huge covering three townships (Kawa, Thanatpin and Waw) in Bago Region and five townships (Paung, Chaungzon, Thaton, Bilin and Kyaikhto) in Mon State. Hence, we identified the potential areas for community forest establishment using such criteria as: (i) Presence of natural/planted mangroves or mudflats; (ii) Security conditions of the site for operating the process; (iii) Social potential in terms of williness, leadership and cohesion; and (iv) Ecological/economic benefits to the communities.

We identified 17 potential CF sites with a total estimated area of 8,540 acres (3,457 hectares) in seven townships, except Waw, of the GoM with field assessment and FGD with communities wherever possible. The initiation of CF establishment is facing with the various difficulties and challenges for the communities involved. Among others, agricultural expansion is the main threat to the natural mangroves and new mudflat areas along the coastline. Furthermore, villagers have limited time and knowledge to actively participate in CF establishment and operations because they are struggling with their livelihood and economic hardships, time allocation for both consultation meeting and site visits, and faced very limited accessibility during the rainy season. On Bago side, the potential sites are far from villages and less accessible to conduct regular monitoring within a limited time.

Our foremost focus should be initiating community consultations, selecting suitable mangrove species for a given site and fostering close collaborations with surrounding villages and relevant stakeholders towards achieving sustainable conservation goal. It is also needed to support and facilitate for the CF application process as many local communities have limited capacity in drafting application letter and formulating CF management plans. Additionally, they need seeds or seedling support and some operational costs of establishing community forests. Natural mangroves or planted mangroves of a certain age should be given priority, following by stable mudflat areas, for further process to be a certified CF provided that there are no issues related to land tenure rights and security. The conservation of mangroves, whether natural or planted, can be effectively achieved through community-led management while formalization of these mangroves as certified CF for securing land tenure may take time under the current circumstances of Myanmar.

2. Introduction

The issue of climate change demands immediate and ongoing global attention, given its relevance in the present and the future. Coastal regions are particularly vulnerable to challenges like sea level rise, flood, storms and coastal erosion. These are the results of multiple factors and many efforts are currently underway to address the pressing concern. Among the various strategies to combat these issues, mangrove forests play a crucial role (Rudianto Rudianto 2022). However, mangroves are one of the most severely threatened ecosystems (Valiela et al., 2001). The loss rate of mangroves was higher than the average loss rate of other tropical and subtropical forests, and losses were recorded in 97% of the countries and territories that included mangroves (IUCN, 2016). Therefore, restoration of mangroves emerges as a viable option to enhance the health and resilience of coastal environments.

Mangroves in Myanmar provide multiple services to coastal communities such as food, fuelwood, medicines, and other non-timber forest products. These habitats are vitally important to fisheries industry and serve as natural barriers that mitigate the impacts of climate-related hazards. These resources have been used by local people for both subsistence and commercial purposes for decades and have substantially contributed to the sustainability and resilience of local economy. Myanmar recognizes that ambitious Community Forestry (CF) programs can extend beyond the protected forest areas. They can also address poverty alleviation, livelihood development, and equality issue, and promote biodiversity conservation. The initial steps in the development of a CF program in the country were taken in 1995 with the issuance of the Community Forestry Instructions (CFI-1995). The early years of CF, which can be defined as an emergent phase, were limited by legislative and institutional challenges.

However, the recent revisions of CFI (CFI-2016 and CFI-2019) have introduced the basic principle that forests will be conserved only when local communities are empowered to derive tangibly benefit from their forests. Since its inception in 1995, Community Forestry (CF) in Myanmar has been primarily defined as the operation and maintenance of forests by rural communities. The CFI (2019) presents a significant advancement in the realms of partnership, participation and decentralization. Local communities are granted trees and forest land tenure rights for an initial 30-year period, which can be extended.

The Gulf of Mottama (GoM) is one of the most significant and unique intertidal wetland systems in the world. Safeguarding the GoM's natural resources and the well-being of its local communities necessitates a holistic approach addressing ecosystems, livelihoods, and governance. The Government of Myanmar has acknowledged the critical need for effective GoM management. Likewise, there is strong enthusiasm from the governments of Mon State and Bago Region, coastal communities, local universities, the private sector, and local and international organizations. The collective commitment offers a remarkable opportunity to develop effective natural resource management for the Gulf. The GoM is one of the most dynamic estuaries in the world, characterized by sediment redistribution, erosion, and accretion on a large scale (GoM Project 2019). The Gulf of Mottama Project (GoMP) envisions a future that the unique biodiversity of the Gulf of Mottama is conserved and sustainably developed for the benefits of communities relying on it. Therefore, the conservation of ecosystems and biodiversity in the area become a paramount goal. As such, the Project is set to conserve, restore and manage 1,000 hectares of ecosystems in the GoM by the end of 2024.

Among diverse ecosystems in the GoM, mangroves are distributed in patches and at early successional stages offering various ecosystem services to local communities. Moreover, in the broader context, mangroves play an important role in enhancing resilience of communities in the face of climate change and other natural disasters. Recognizing their importance, the Project is strategizing to establish CFs through collaboration and leadership of communities. Therefore, the Project has undertaken the assessment of potential CF sites across eight townships by employing different methods such as advanced Remote Sensing and GIS technique using satellite imagery, Focus Group Discussion (FGD), field assessment to validate the potential sites.

2.1. Objectives

The assessment was carried out to achieve the following objectives:

- To validate the map and locations of potential CF sites derived from satellite images by means of ground-truthing and community engagement through FGD;
- To collect the update information about potential CFs on the mangrove and available land, especially newly formed mudflats;
- To identify potential areas that are suitable for community forest establishment in the future; and
- To understand the current circumstances in terms of challenges, conflicts and limitations on CF application process.

2.2. Assessment Approach

Firstly, we used land use land cover map (Aung K. H. et al., 2022) of the GoM area as a baseline information to identify potential CF sites because the map shows natural mangroves, mudflats and surround villages and other related land uses. We could have identified mudflat areas that are potential for CF establishment during the Participatory Coastal Land Use Planning Workshops/Meetings. We conducted field assessments in those villages where natural mangroves were growing nearby or mudflats are stable for six to seven years in order to observe ground conditions of natural mangroves in terms of vegetation cover and land stability. FGDs were made with village elders and local authorities who are interested in and leading conservation works in the village. For those villages in Chaungzon Township with security concerns, we conducted the assessment of potential CF sites through literature review on previous works by the Project and other partners.

3. Data Collection

3.1. Land Use Land Cover Map

Initially, maps were produced using RS-GIS to identify how much mangrove forest areas are existing in the Project area. We typically utilized the land use land cover map (Aung K.H. et al., 2022) that was derived from analysis of Sentinel 2 images done with the support of the Project (Figure 1).

3.2. Participatory Coastal Land Use Planning

The Project organized a series of Participatory Coastal Land Use Planning (PCLUP) workshops involving community members from the project townships in August and September 2023. One of the conservation activities pinpointed during these planning workshops was CF establishment, and hence we collected information pertaining to potential CF areas. In these workshops, the potential CF sites identified were mainly mudflat areas since the majority of villages lacked natural mangroves but endowed with newly formed mudflats. The communities seemed to be interested in utilizing these mudflat areas to prevent from land grabbing from outsiders, to integrate aquaculture such as fish or crab, and to protect from climate change impacts and coastal erosions.



Figure 1: Land use land cover map of the GoM produced by Kyaw Htet Aung et al. (2022) using Sentinel2 imageries

3.3. Field Assessment

The field assessments were conducted in May, June, September, and October 2023 in Thaton, Paung and Kawa Township. The purposes of field assessments were to validate and collect preliminary data on natural/planted mangroves and to observe the ground situations of mangroves or mudflats including vegetation cover and land stability.

3.4. Focus Group Discussion

In order to validate the maps produced through RS/GIS and Google Earth, FGDs were made with local communities residing in the villages characterized by a considerable area of mangrove existed, naturally and planted, and stable mudflats. FGDs were conducted with a selected group of community members, consisting of at least 5-12 members such as Village Development Committee (VDC), Fisher Development Association (FDA), Local Conservation Group (LCG), Village Administration and other elders. During FGDs, questionnaire-based interviews were employed to gather further insights into various aspects including land use patterns, mangrove conservation practices, community interest and leadership, and the impacts of conservation works on their livelihood, awareness level, land use conflicts, threats and challenges.

3.5. Secondary Data

We reviewed and incorporated previous assessments done by the Project and other partners for mangrove establishment and conservation. These works included efforts made by Soe Min Oo (Ecosystem Management Officer, GoMP), Kyaw Htet Aung (Technical Officer, GoMP) and WIF, especially for those villages with security concerns under the current situations.

4. Results

We identified a total of 8540 acres (3457 hectares) in 17 potential sites (Figure 1 and Table 1) for community forest establishment following such assessment criteria as: (i) Presence of natural/planted mangroves or mudflats; (ii) Security conditions of the site for operating the CF process; (iii) Social potential in terms of wiliness, leadership and cohesion; and (iv) Ecological/economic benefits to the communities. Among these 17 sites, the following nine sites exhibit considerably high potential for proceeding with next steps towards improvement.

4.1. Paung Township, Sae Eain Su village

Through the focus group discussion and field assessment, we observed a potential CF area covering 100 acres of planted mangrove which was situated nearby Sae Eain Su village. This plantation was established on the communal land by the Forest Department (FD) in 2019 for the communities. According to communications with village leaders/elders, FD will have no objection if the community applies that area to be a CF. The community needs to consult with nearby villages (e.g., Mar Lar Chaung) and to obtain approval of other concerned departments (particularly General Administration Department).

4.2. Paung Township, Wea Pa Tan and Ahlat (South) village

In Wea Pa Tan village, the mangrove tree species naturally grow along the coastal area. The estimated potential CF area was about 3 miles along the coast, on the communal land. It was digitized and calculated by GIS software and potential area is 461 acres. The natural mangrove belongs to and is adjacent to the land of the Wea Pa Tan and Ahlat (Taung Paing) villages. A mangrove nursery was established there by the Project for mangrove plantations and mangrove multi-species plantations in



Figure 2. Mangrove condition of potential CF site in Wea Pa Tan village, Paung Township, seen in Google Satellite Map in 2023 the nearby areas. Community leadership was observed to be strong but wider consultations should be conducted with the two villages for CF application process.

4.3. Paung Township, Kar Te village

By the technical and financial support of the Project, the community awarded the CF certificate in 2019 to conserve 300 acres of natural mangroves. The GoMP supported for the enrichment planting (a total of 62 acres, year by year) with direct seeds and seedlings, survival counting, nursery establishment, crab farming within mangrove and pillars of the CF area. There was an opportunity to expand the CF area if the security condition allows and there is no conflict of interests between the communities.



Figure 3. Mangrove condition of potential CF site in Kar Te village, Paung Township, seen in Google Satellite Map in 2017 (left) and in 2023 (right).

4.4. Thaton Township, Aung Kan Thar village

Through the focus group discussion and field assessment, we observed that the potential CF area was about 664 acres. The mangrove restoration was initiated by the Project since 2016 on new mudflat area. The Project supported nursery establishment with diverse mangrove species and planted about 200 acres in total till 2023. The above-mentioned area was excluded when FD proposed an area of about 5,000 acres for a Protected Public Forest (PPF) through the support of World View International Foundation (WIF). WIF already implemented a vast area of mangrove plantation within the proposed PPF. The soil of the mudflat seemed to be stable with good mangrove condition under the regular monitoring and systematic management by WIF. Mangrove deterioration due to human disturbance has been notably reduced with exception of agricultural land expansion, because WIF erected the boundary pillars and warning/awareness sign boards. The land type is still recognized as land at the disposal of the government. There does not appear social conflict about land tenure. With the support of WIF, the CF application process to FD was undertaken since 2021 in order to obtain the right to sustainably utilize and manage 500 acres of land. However, it is necessary to renew or restart the CF application process due to delay in government procedure.

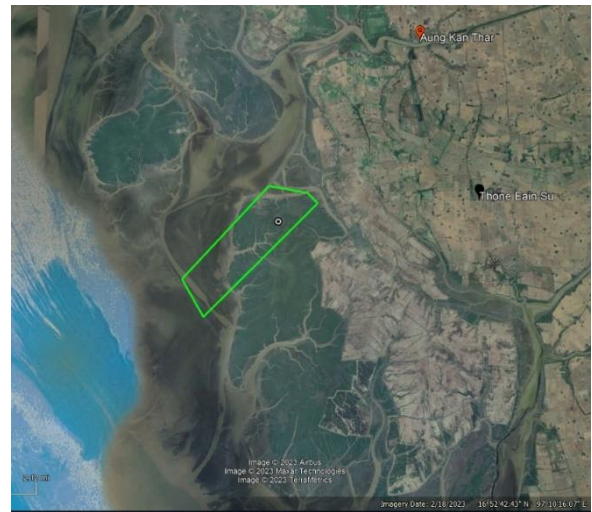


Figure 4. Mangrove condition of potential CF in Crab Island, Aung Kan Thar village, Thaton Township, seen in Google Satellite Map in 2023

4.5. Bilin Township, Mu Thin village

We conducted the community engagement at the village and observed ground conditions for potential CF. The mudflat area was appeared along the Bilin River about 6-7 years ago, having an estimated area of 76 acres might not be possible to implement mangrove planting trees. We found that mangrove planting could be undertaken for a small area as a pilot to test soil stability. Furthermore, we were aware that there was another potential CF site near the village. Following the community discussion, it appeared that there is approximately 30 acres of land available for mangrove plantation, strategically positioned between the coastal area and agricultural land, with added benefit of mitigating coastal erosion in the near future. This land area is unlikely to give rise to social conflicts as it is land at the disposal of the government and its tenure is not settled yet. However, it is imperative to conduct wider community consultations with the farmers to emphasize the importance of refraining from agricultural land expansion and to determine the ecologically suitable mangrove species for planting due to occasional reach of tidal water.



Figure 5. Mudflat condition of potential CF site in Mu Thin village, Bilin Township, seen in Google Satellite Map in 2023

4.6. Chaungzon Township, Sel Pa Lar village

According to WIF (2022), the results showed that mangrove was growing naturally in the vicinity Sel Pa Lar village with an estimated area of about 128 acres. Village leaders took proactive steps to safeguard and conserve the mangrove forest as a village-owned fuelwood mangrove plantation with the permission of the Forest Department. However, in order to safeguard the mangrove forest and mudflats, it is needed to secure land tenure rights, as emphasized by WIF (2022).

4.7. Chaungzon Township, Taw Ka Mar village

According to Aung K. H. and Oo S. M. (2022), the existing mangrove area covered about 2400 acres near Taw Ka Mar village in Chaungzon Township. However, over the last 18 years, there has been a notable absence of mangrove forests. This absence resulted in severe erosion in some big villages along the coast. At present, the founder of Mangrove Reservation Community (MRC) who is passionate about promoting mangrove friendly ecotourism in this area, has put forth a proposal to obtain 300 acres of CF near the village to District Forest Department. GAD and the local authority of Taw Ka Mar village have expressed reluctance to support mangrove conservation efforts, including CF initiative and others). Surprisingly, they have allowed business interests from outside the area who do not prioritize conservation.

4.8. Kawa Township, Aung Naing Gyi village

During the Participatory Coastal Land Use Planning (PCLUP) workshop in Bago, a potential CF area was identified through a group work and computed to be 81 acres by a GIS software near Aung Naing Gyi village, Kawa Township. The villagers are willing to establish a CF, they need support from any external organization in the application process, CF management plan development and CF operations. They already possess significant knowledge about mangrove ecology. In this village, their primary motivation for CF establishment is to sell carbon credit in cooperation with WIF carbon project. This endeavor involves conserving planted mangrove, with the proceeds earmarked for supporting village's school upgrade and facilitating higher education at the local level. They expressed a strong interest and a heightened level of awareness regarding mangrove conservation and restoration. There was no conflict on land use as it was a communal land and adjacent to the agricultural land. The ongoing focus is on enhancing awareness and interest among the local farmers to secure their cooperation, in order to prevent the agricultural expansion.

4.9. Kawa Township, War Taw village

According to group work in PCLUP workshop in Bago, the participants indicated a potential CF area covering an estimated 2034 acre of new mudflat near War Taw village in Kawa Township. Following more in-depth discussion with some villagers, there is a collective interest in establishing this area as a community-based management zone. This initiative involves the implementation of collaborative, and participatory approach, incorporating co-management strategies. In this approach, the local community will be granted the rights to sustainably use and maintain natural resources, including mangrove, fish and mud crab, and within the new mudflat area.



Figure 6. Mudflat conditions of potential CFs in War Taw and Khe Nan Ah Thin villages, Kawa Township, seen in Google Satellite Map in 2023

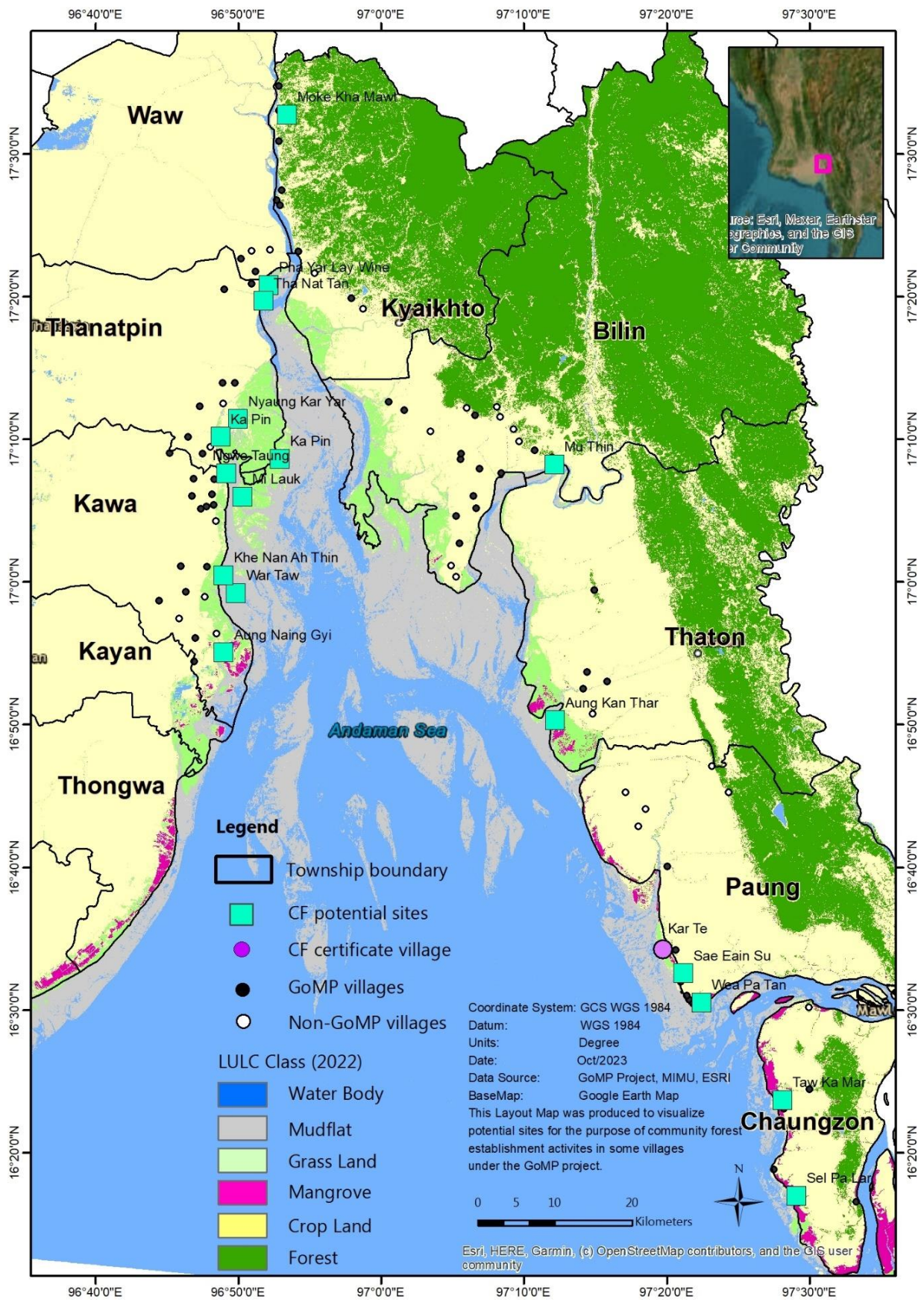


Figure 7. Map showing potential CF sites in the GoM area, overlaid on the Land Use Land Cover Map 2022.

Table 1. Potential CF sites in the Gulf of Mottama area. These area estimates are calculated by GIS software and are subject to change after wider stakeholder consultations.

No.	Village	Township/ Region/State	Area (acres)	Remarks
1	Wea Pa Tan	Paung, Mon	461	<ul style="list-style-type: none"> Natural mangrove Done FGD and field assessment The community was strongly interested in mangrove conservation Need to negotiate with Ahlat (South) village
2	Sae Eain Su	Paung, Mon	100	<ul style="list-style-type: none"> Planted mangrove Planted by FD (100 ac) in 2018-19 Done FGD and field assessment The community was strongly interested in mangrove conservation Need to negotiate with Mar Lar Chaung village
3	Aung Kan Thar	Thaton, Mon	664	<ul style="list-style-type: none"> Crab island of natural mangroves mixed with 200 acres of planted mangrove supported by GoMP Done FGD and field assessment The community was strongly interested in mangrove conservation with additional benefit from crab collection Falls within the fishery co-management zone designated by the State Department of Fishery in 2018 Applied for CF once but need to renew or restart the CF application process due to delay in government procedure
4	Sel Pa Lar	Chaungzon, Mon	128	<ul style="list-style-type: none"> Natural mangrove (Ref: WIF Report, GoMP, 2022) Security issue with low interest in cooperation and permission by GAD Could not undertake FGD and field assessment due to local security issues under the current situations
5	Taw Ka Mar	Chaungzon, Mon	2400	<ul style="list-style-type: none"> Natural mangrove Done FGD and field assessment (Ref: CF potential Report, 2022 by Soe Min Oo and Kyaw Htet Aung) Security issue, low interest in cooperation and difficult permission by GAD
6	Mu Thin	Bilin, Mon	76	<ul style="list-style-type: none"> New mudflat formed since six to seven years ago along the Bilin River Done FGD and field assessment Strong community interest in mangrove conservation Depending on soil stability of the site, establishment of mangrove plantation should be done in a small scale as a trial and then upscaled the planted area. In addition to 76 acres, there were some other potential areas for mangrove planting that can be CF or other forms of planting for protection from riverbank erosion and stability of embankment/dyke.
7	Moke Kha Mawt	Kyaikhto, Mon	120	<ul style="list-style-type: none"> Bare land with sparse trees Strong community interest in mangrove conservation Could not undertake FGD and field assessment due to local security issues under the current situations
8	Aung Naing Gyi	Kawa, Bago	81	<ul style="list-style-type: none"> Natural mangrove on new mudflat with sparsely distributed mangrove trees Done FGD and field assessment Strong community interest in mangrove conservation
9	War Taw	Kawa, Bago	2034	<ul style="list-style-type: none"> New mudflat Done FGD but field assessment needs to do

				<ul style="list-style-type: none"> • Strong community interest in mangrove conservation
10	Ngwe Taung	Kawa, Bago	116	<ul style="list-style-type: none"> • New mudflat • Strong community interest in mangrove conservation • Need to conduct field assessment in terms of vegetation cover, land stability, social conflicts of interests, etc.
11	Mi Lauk	Kawa, Bago	424	<ul style="list-style-type: none"> • New mudflat • Strong community interest in mangrove conservation • Need to conduct field assessment in terms of vegetation cover, land stability, social conflicts of interests, etc.
12	Khe Nan Ah Thin	Kawa, Bago	106	<ul style="list-style-type: none"> • New mudflat • The community was interested in mangrove conservation. • Need to conduct field assessment in terms of vegetation cover, land stability, social conflicts of interests, etc.
13	Nyaung Kar Yar	Thanatpin, Bago	110	<ul style="list-style-type: none"> • New mudflat • The community was strongly interested in mangrove conservation • Necessary to negotiate Shwe Oo village • Need to conduct FGD and field assessment in terms of vegetation cover, land stability, social conflicts of interests, etc.
14	Pha Yar Lay Wine	Thanatpin, Bago	279	<ul style="list-style-type: none"> • New mudflat • The community was interested in mangrove conservation. • Need to conduct FGD and field assessment in terms of vegetation cover, land stability, vegetation cover, social conflicts of interests, etc.
15	Tha Nat Tan	Thanatpin, Bago	331	<ul style="list-style-type: none"> • New mudflat • The community was interested in mangrove conservation. • Need to conduct field assessment in terms of vegetation cover, land stability, social conflicts of interests, etc.
16	Ka Pin	Thanatpin, Bago	280	<ul style="list-style-type: none"> • New mudflat • The community was interested in mangrove conservation. • Need to conduct field assessment in terms of vegetation cover, land stability, social conflicts of interests, etc.
17	Ka Pin	Thanatpin, Bago	830	<ul style="list-style-type: none"> • New mudflat • The community was interested in mangrove conservation • Need to conduct field assessment in terms of vegetation cover, land stability, social conflicts of interests, etc.
Total Area (acre)			8540	

5. Procedure for Establishment of Community Forest

According to the CFI (2019), the community which wants to apply for the establishment of Community Forest shall pursue the following steps:

- Community Forest User Group (CFUG) shall be formed with households that are interested in Community Forestry and whose livelihoods depend truly on forest; In the formation of the CFUG, facilitators can be asked for coordination and suggestions;

- Each CFUG shall form a Management Committee (MC) consisting of a chairman, a secretary, a treasurer and two members elected unanimously from among the CFUG members; Gender equity shall be considered in the formation of the MC; The number of the MC members can be increased as necessary; With majority approval of the CFUG, the MC can change the list of the CFUG members.
- On behalf of the CFUG, the chairman of the MC can apply for Community Forestry Certificate, to the District Forest Officer through Township Forest Officer, using the prescribed Form.
- Upon receipt of the application for establishment of Community Forest, the District Forest Officer (DFO) shall pursue the following steps of actions:
 - If the application is accepted, the DFO shall verify and validate the land applied for the establishment of the Community Forest.
 - If the land applied for is not under the management of the Forest Department (Reserved Forest, Protected Public Forest and Protected Area), the DFO shall obtain approval to use the land from the relevant department or organization which is managing that land.
- Upon receipt of permission from the DFO to use land to establish a Community Forest, the CFUG shall prepare a management plan, using the prescribed Form, in consultation with facilitators; and submit it to the DFO for confirmation.
- Upon confirmation of the management plan, the DFO shall issue the Community Forestry Certificate to the CFUG. The duration of land lease for the establishment of Community Forest is initially set for (30) years and can be extended for another 30 years with multiple times.
- The CFUG shall abide by existing forest law, forest rules, regulations and prescriptions of the management plan; and if found neglected or violated, the DFO may revoke the certificate with the approval of State/Regional Forest Officer.

The external organization such as CSO/NGO can take the roles of facilitation and support in each of the above-mentioned steps. In the stage of CFUG formation, it is crucial to ensure wider and adequate stakeholder consultations within and outside the community so as to avoid conflicts of interest and land tenure issues. The CFUG needs facilitations for not only CF application but also management plan preparation. After permission is obtained, the CFUG may need financial and technical support from external organization and FD to implement the management plan, especially in the early stage of CF establishment.

6. Main Challenges

- Expansion of agricultural land expansion has occurred along the mudflat areas (e.g., Aung Kan Thar village and Thone Eain Su village). Moreover, external businessmen have encroached over these lands, contributing to land conversion.
- The majority of communities have not received any form of support for the conservation of mangroves and mudflat areas, with the exception of support from GoMP. Local authorities and communities even showed a stronger inclination towards agricultural land utilization.
- Cutting of mangrove trees for fuelwood was found to be a challenge (e.g., Wea Pa Tan village) and the preferred species for fuelwood cutting are *Avicennia officinalis* and *Sonneratia Apetala*.
- Villagers have a limited time available for engaging in the establishment of CF due to their livelihood struggles and economic hardships.
- The communities need support from relevant departments and external organizations/projects for choice of suitable species, seeds or seedlings, management operations of CF, etc.
- Other challenges are monitoring and care-taking activities of post-plantation establishment. These activities are crucial for safeguarding the land against the impacts of grazing and damage from animal husbandry.
- In some cases, the potential CF sites are far from villages and less accessible to conduct regular monitoring within a limited time, more significantly in Bago Region.
- Furthermore, the communities lack dedicated funding and continuous technical support for the entire process of CF application, systematic CF management and public consultations.

- Township GAD is especially a major barrier for conservation activities due to lack of trust. For example, in Chaungzon Township, MRC submitted application of CF establishment with the recommendation of FD, however it did not obtain the endorsement/approval of GAD yet.
- The conservation of mangroves, whether natural or planted, can be effectively achieved through community-led management while formalization of these mangroves as certified CF for securing land tenure may take time under the current circumstances of Myanmar.

7. Conclusions and Recommendations

Awareness and Consultations

1. There is a need to raise public awareness on how to sustainably use land resource, whether mangroves or mudflats, and facilitate consultations for obtaining community's consent and understanding the perceptions of neighboring communities.
2. It could be effective to implement installation of signboards with a particular focus on illegal tree cutting and local farming and establish a routine for monitoring and patrolling activities in order to prevent further expansion of agricultural land into the natural mangroves.

External Support

3. Technical and financial assistance from relevant departments and/or external organization is required right from the beginning of application process, CF management planning up to the acquisition of CF certificate because the communities have limited experiences on how to write an application letter.
4. Seed and seedlings should be distributed while considering the implementation of Cash for Work program for local labor which can partially contribute to improving local livelihood and maximizing environmental conservation efforts.

Mangrove Restoration and Silviculture

5. Wherever possible, an integrated approach should be implemented such as silvo-aquaculture involving fish or mud crab with tree growing, and innovative business model should be considered such as carbon credit selling while maintaining land stability and minimizing climate change impacts.
6. Implementing maintenance activities for mangrove-planted area, for example, weed control and periodic assessment of tree survival could prove beneficial.
7. Enrichment planting (line planting or gap planting) could be considered in some natural mangroves of potential CF areas.
8. Through a rapid assessment of local economic preferences, ecologically suitable species such as Byuchedauk Apho (*Rhizophora apiculata*) and Byuchedauk Ama (*Rhizophora mucronata*) should be selected for mangrove plantation depending on the stability of soil condition and tidal reach.
9. Natural mangroves or planted mangroves of a certain age should be given priority, following by stable mudflat areas, for further process to be a certified CF provided that there are no issues related to land tenure rights and security.

Advocacy and Sustainable Management

10. Advocacy is imperative to facilitate communication and coordination with the FD, GAD and DALMS, particularly if formal procedures are necessary to guarantee land tenure security.
11. The Regional/State Government's approval plays an important role in some cases to implement conservation activities in terms of biodiversity and ecosystems, including mangrove conservation.
12. The capacity of local communities needs to be strengthened to enable active participation in decision-making and effective implementation of sustainable coastal natural resources management.

Acknowledgement

This assessment is carried out as part of the SDC-funded Gulf of Mottama Project, in which IUCN is implementing in collaboration with HELVETAS and Network Activities Group (NAG). We would like to thank U Soe Min Oo, Ecosystem Management Officer, Helvetas, for data sharing such as project reports and documents, which contributed to literature review and field assessment on the ground. We also thank GoMP team members such as TCCs, and Community Facilitator and Monitors (CFMs) who supported in organizing community meetings and verification of the results with their project knowledge. Special thanks go to local communities who actively participated in our field survey and participatory mapping activities.

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Record Photos



Photo 1. FGD at Aung Kan Thar village, Thaton Township (Photo by Soe Min Oo, EMO)



Photo 2. FGD at Aung Naing Gyi village, Kawa Township (Photo by Hein Tin Aung, Bago CFM)



Photo 3. FGD at Aung Naing Gyi village, Kawa Township (Photo by Hein Tin Aung, Bago CFM)



Photo 4. Field assessment at mudflat of Aung Naing Gyi village, Kawa Township (Photo by Hein Tin Aung, Bago CFM)



Photo 5. Field assessment in Wea Pa Tan village, Paung Township (Photo Hla Myo , Paung CFM)



Photo 6. Group work mapping activities for coastal land use map (current and future) by each village (Photo by Zun Pwint Oo, MCCL)



Photo 7. Group work mapping activities for coastal land use map (current and future) by each village (Photo by Zun Pwint Oo, MCCL)



Photo 8. Group work mapping activities for coastal land use map (current and future) by each village (Photo by Zun Pwint Oo, MCCL)