RINGKASAN

UUS USMAN. Analisis Baseline Rehabilitasi Hutan Mangrove dalam Menunjang Kestabilan Ekosistem Pesisir Di Pantai Utara Jakarta. Dibimbing oleh Dr. Endang Hilmi, S.Hut. M.Si dan Dr. Ir. Achmad Iqbal, M.Si.

Ekosistem hutan mangrove merupakan salah satu sumberdaya atau ekosistem yang memiliki fungsi ekonomi, ekologi dan sosial (Hilmi, et al., 2017) serta merupakan salah satu ekosistem yang unik dan dinamis karena berada di wilayah pasang surut peralihan ekosistem darat dan laut (Sofian et al., 2019). Fungsi ekologis hutan mangrove antara lain: sebagai pelindung garis pantai dari abrasi dan banjir, mencegah intrusi air laut, sebagai tempat tinggal (habitat), tempat mencari makan (*feeding ground*), tempat asuhan dan pembesaran (*nursery ground*), dan tempat pemijahan (*spawning ground*) bagi aneka biota perairan, serta sebagai pengatur iklim mikro (Noor et al., 2006).

Saat ini Ekosistem mangrove mengalami banyak tekanan dan termasuk di Pantau Utara Jakarta sebagai ekosistem yang paling terancam di wilayah pesisir (Ahmed et al., 2021). Pemanfaatan ekosistem mangrove berlebih seperti pembukaan tambak secara besar-besaran dan konversi lahan mangrove menjadi peruntukan lain menjadi salah satu penghasil tekanan terbesar terutama di wilayah pesisir (Brander et al, 2012; Friess & Webb, 2014; Sofian et al., 2019) Potensi ancaman degradasi mangrove semakin besar di daerah yang dekat dengan pusat kegiatan ekonomi (Kustandiyo et al., 2014), termasuk di Kawasan pesisir utara Jakarta.

Tujuan dari penelitian analisis baseline rehabilitasi hutan mangrove dalam menunjang kesetabilan ekosistem pesisir di Pantai Utara Jakarta adalah (1) menganalisis baseline kawasan mangrove Pantai Utara Jakarta dari tahun 2000, 2010, 2020; (2) menganalisis Jasa ekosistem dari aktivitas rehabilitasi mangrove yang dilakukan di Pantai Utara Jakarta; (3) membangun startegi pengelolaan ekosistem mangrove dengan memperhatikan faktor internal dan eksternal serta yang berpotensi berpengaruh terhadap kegiatan rehabilitasi ekosistem mangrove di Jakarta.

Hasil penelitian menunjukan bahwa Faktor lingkungan pendukung ekosistem mangrove di Pantai Utara Jakarta dapat dilihat pada Tabel 4.1. Tabel ini menjelaskan bahwa ekosistem mangrove di Pantai Utara Jakarta memiliki karakteristik yaitu (1) suhu antara 24,6-31.5oC, (2) salinitas air tanah antara 5,6 – 7,0 ppt, (3) salinitas air antara 0,1-9,8 ppt, (4) pH air tanah antara 6,25-7,0, (5) pH air antara 5,83-6,5, (6) oksigen terlarut antara 1,4-3,5 mg/L , (7) nitrat tanah antara 12,2-22,8 mg/L(8) fosfat tanah antara 1,7-14,8 mg/L (9) pirit tanah antara

0,12-0,3 mg/L dan (10) tekstur tanah antara lempung berlumpur lempung liat berlumpur.

Ekosistem mangrove di Pantai Utara Jakarta didominasi oleh *Avicennia marina, Rhizophora mucronata, Rhizophora apiculata, Rhizophora stylosa, Nypa frutican , Sonneratia alba* dan *Sonneratia caseolaris* sebagai pohon dengan dominasi tinggi. Kemudian *Bruguiera gymnorhiza, Carbera manghas, Exceocaria agallocha* sebagai pohon dengan dominasi rendah dan *Ficus superba*, *Terminalia cattapa, Callophyllum inophyllum, Cerbera manghas* sebagai mangrove asosiasi. Data tersebut menggambarkan bahwa mangrove di Pantai Utara Jakarta hanya memiliki dua kategori yaitu jarang dan sangat jarang kepadatannya. Kepadatan jarang ditemukan di kawasan ekowisata Mangrove, Hutan Lindung Angke Kapuk, Arboretum Mangrove dan kategori sangat jarang ditemukan di Kawasan Mangrove Galatama, *Greenbelt* Mangrove Elang dan Suaka Marga Satwa Muara Angke.

Tren penurunan ekosistem mangrove di Pantai Utara Jakarta (meningkatnya luasan mangrove yang sangat jarang) disebabkan oleh konversi mangrove (Orchard et al. 2015; Salampessy et al. 2015; Pham et al. 2018), genangan permanen (Bullock et al. 2017; Bathmann et.at., 2021; (Hilmi, Sari, Siregar, et al., 2021) Hilmi et.al. 2021f, 2022c), pasang surut (Giri et.al., 2015; Hilmi et.al., 2022a), sedimentasi tanah (Sari et.at., 2015, 2016; Nur dan Hilmi 2021) komunitas aktivitas (Asbridge et.al. 2015), aktivitas industri (De Valck dan Rolfe 2018) dan pencemaran air (Prastyo et.al., 2017; Zhang et.al., 2019). Dampak penurunan mangrove di Jakarta adalah penurunan muka tanah (Takagi et al. 2021; Hilmi et al. 2022a), intrusi air laut (Morgan dan Werner 2015; Suhartono et al. 2015; Hilmi et al. 2017a), abrasi (Randy et al. 2015; Hilmi 2018; Nur dan Hilmi 2021), pasang surut (Marois dan Mitsch 2017; Hilmi et.al., 2022a) dan sedimentasi (Sari dkk. 2016; Hilmi et.al., 2021h)

.Strategi pengembangan pengelolaan rehabilitasi mangrove untuk menunjang kestabilan ekositem dianalisis melalui matriks SWOT yang dilakukan berdasarkan kombinasi nilai kondisi lingkungan faktor internal yang terdiri dari kekuatan (*strenghts*) dan kelemahan (*weakness*) beserta nilai kondisi lingkungan faktor eksternal yang terdiri dari peluang (*opportunities*) dan ancaman (*threats*) menunjukan nilai yang terletak dalam kuadran III (negatif-positif) yaitu posisi mendukung strategi W-O yang meminimalkan kelemahan untuk memanfaatkan peluang dengan menghindari ancaman, Posisi kuadran III ini menandakan upaya pengembangan yang lemah namun memiliki peluang yang baik. Rekomendasi strategi pada posisi ini adalah perubahan strategi, pengelola mangrove harus merubah strateginya untuk memanfaatkan peluang yang ada, karena dikhawatirkan strategi yang lama tidak dapat memanfaatkan peluang tersebut.

Berdasarkan matriks strategi yang startegi W-O yang dikembangkan untuk membangun rehabilitasi mangrove dalam menunjang kestabilan ekosistem di Kawasan Pantai Utara Jakarta

dilakukan melalui : (1) rehabilitasi Mangrove; (2) revitalisasi Kawasan Ekosistem Mangrove di Pantai Utara Jakarta yang terintegrasi dengan pengembanagn pulau-pulau reklamasi; (3) pembangunan ekonomi kreatif yang berbasis ekositem mangrove; (4) pembangunan jalur hijau (*green belt*) untuk mengurangi resiko bencana; (5) peningkatan kompetensi SDM dan stakeholder dalam pengelolaan Mangrove; (6) pengembangan potensi *Blue Carbon* dalam rangka ikut mendukung target pencapaian NDC

ABSTRACT

UUS USMAN. Baseline Analysis of Mangrove Forest Rehabilitation in Supporting the Stability of Coastal Ecosystems on the North Coast of Jakarta. Supervised by Dr. Endang Hilmi, S.Hut. M.Si dan Dr. Ir. Achmad Iqbal, M.Si.

The mangrove forest ecosystem is a resource or ecosystem that has economic, ecological, and social functions (Hilmi et al., 2017) and is a unique and dynamic ecosystem because it is located in the tidal area of transition of land and sea ecosystems (Sofian et al. ., 2019). The ecological functions of mangrove forests include: protecting the shoreline from abrasion and flooding, preventing seawater intrusion, as a habitat, a feeding ground, a nursery ground, and a spawning ground. ground) for various aquatic biota and a microclimate regulator (Noor et al., 2006).

The mangrove ecosystem is under much pressure and is included in the North Jakarta Coast as the most threatened ecosystem in the coastal area (Ahmed et al., 2021). Excessive use of mangrove ecosystems, such as the opening of large-scale ponds and the conversion of mangrove land to other uses, is one of the biggest pressure generators, especially in coastal areas (Brander et al., 2012; Friess & Webb, 2014; Sofian et al., 2019) Potential threats Mangrove degradation is greater in areas close to centers of economic activity (Kustandiyo et al., 2014), including in the northern coastal area of Jakarta.

The objectives of the baseline analysis of mangrove forest rehabilitation in supporting the stability of coastal ecosystems on the North Coast of Jakarta are (1) to analyze the baseline of the mangrove area of the North Coast of Jakarta from 2000, 2010, 2020; (2) analyzing ecosystem services from mangrove rehabilitation activities carried out on the North Coast of Jakarta; (3) developing a mangrove ecosystem management strategy by taking into account internal and external factors as well as those that have the potential to influence mangrove ecosystem rehabilitation activities in Jakarta.

The study results show that the environmental factors supporting the mangrove ecosystem on the North Coast of Jakarta can be seen in Table 4.1. This table explains that the mangrove ecosystem on the North Coast of Jakarta has characteristics, namely (1) temperature between 24.6-31.5oC, (2) groundwater salinity between 5.6 – 7.0 ppt, (3) water salinity between 0.1 -9.8 ppt, (4) groundwater pH between 6.25-7.0, (5) water pH between 5.83-6.5, (6) dissolved oxygen between 1.4-3.5 mg/L, (7) soil nitrate between 12.2-22.8 mg/L (8) soil phosphate between 1.7-14.8 mg/L (9) soil pyrite between 0.12-0.3 mg/L and (10) soil texture

between silty loam and silty clay loam.

The mangrove ecosystem on the North Coast of Jakarta is dominated by *Avicennia marina, Rhizophora mucronata, Rhizophora apiculata, Rhizophora stylosa, Nypa frutican, Sonneratia alba* and *Sonneratia caseolaris* as trees with high dominance. Then *Bruguiera gymnorhiza, Carbera manghas, Exceocaria agallocha* as trees with low dominance and *Ficus superba, Terminalia cattapa, Callophyllum inophyllum, Cerbera manghas* as association mangroves. The data illustrates that mangroves on the North Coast of Jakarta only have two categories, namely rare and very rare in density. Density is rarely found in the Mangrove ecotourism area, Angke Kapuk Protection Forest, Mangrove Arboretum, and very rare categories in the Galatama Mangrove Area, Greenbelt Mangrove Elang, and Muara Angke Wildlife Sanctuary.

The declining trend of mangrove ecosystems on the North Coast of Jakarta (increasing the area of mangroves which is very rare) is caused by mangrove conversion (Orchard et al. 2015; Salampessy et al. 2015; Pham et al. 2018), permanent inundation (Bullock et al. 2017; Bathmann et.at., 2021;(Hilmi, Sari, Siregar, et al., 2021) Hilmi et al., 2021f, 2022c), tides (Giri et al., 2015; Hilmi et al., 2022a), soil sedimentation (Sari et.at., 2015, 2016; Nur and Hilmi 2021) community activities (Asbridge et al. 2015), industrial activities (De Valck and Rolfe 2018) and water pollution (Prastyo et al., 2017; Zhang et al., 2019). The impacts of mangrove reduction in Jakarta are land subsidence (Takagi et al. 2021; Hilmi et al. 2022a), seawater intrusion (Morgan and Werner 2015; Suhartono et al. 2015; Hilmi et al. 2017a), abrasion (Randy et al. 2015; Hilmi 2018; Nur and Hilmi 2021), tides (Marois and Mitsch 2017; Hilmi et al., 2022a) and sedimentation (Sari et al. 2016; Hilmi et al., 2021h)

The strategy for developing mangrove rehabilitation management to support ecosystem stability is analyzed through a SWOT matrix which is carried out based on a combination of internal factor environmental condition values consisting of strengths and weaknesses along with external factor environmental condition values consisting of opportunities and threats. (threats) shows a value located in quadrant III (negative-positive), namely a position that supports the W-O strategy that minimizes weaknesses to take advantage of opportunities by avoiding threats. This quadrant III position indicates a weak development effort but has good opportunities. The strategy recommendation in this position is a change in strategy, and mangrove managers must change their strategy to take advantage of current opportunities because it is feared that the old strategy will not be able to take advantage of them.

Based on the strategy matrix, the W-O strategy developed to build mangrove

rehabilitation in supporting ecosystem stability in the North Jakarta Coastal Area is carried out through: (1) Mangrove rehabilitation; (2) revitalization of the Mangrove Ecosystem Area on the North Coast of Jakarta which is integrated with the development of reclamation islands; (3) development of a creative economy based on mangrove ecosystems; (4) construction of green belts to reduce disaster risk; (5) increasing the competency of human resources and stakeholders in managing mangroves; (6) developing the potential of Blue Carbon in order to participate in supporting the target of achieving the NDC.