

COMMUNITY SERVICE FOR THE RESTORATION OF THE CUSTOMS ACADEMY BUILDING IN KAMPUNG TANJUNG SURAT, JOHOR, MALAYSIA

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Abstract

Kampung Tanjung Surat on Tanjung Surat Island, Kota Tinggi, Johor, is a coastal island community that has developed through ecotourism initiatives and mangrove conservation, with primary access via waterways and support from various CSR programs and university and public agency service-learning initiatives. This community service program focuses on light restoration and repainting of a support building used for community activities and field training related to the Royal Malaysian Customs Academy (AKMAL), with emphasis on coastal environmental resilience (high humidity, salt spray) and cost efficiency through community gotong royong (collective work). The measured work area is 400 m², covering the main room's exterior-interior walls and veranda, with the selection of a weather-resistant exterior paint system, anti-alkali primer, anticorrosive coatings for metal elements, and a color scheme harmonious with local maritime culture. Work was carried out on weekends to minimize disruption to daily economic activities, resulting in improved comfort, aesthetics, and service life of the facility that supports community activities and field-learning collaboration in Tanjung Surat.

Keywords: *Community Service, Light Restoration, Repainting, Coastal, Tanjung Surat, AKMAL*

INTRODUCTION

Tanjung Surat Island lies at the mouth of the Johor River and is a unique area due to its strategic location and close ties to local community life. Access via a short crossing from the mainland makes the island easy to visit, facilitating smooth movement of residents, tourists, and external stakeholders. The three main villages shaping the social landscape of Tanjung Surat Island—Kampung Tanjung Surat, Kampung Linting, and Kampung Nyior—not only reflect traditional coastal settlement patterns but also preserve the heritage and local wisdom of maritime Malays. Moreover, the area is renowned for its well-preserved mangrove swamp ecosystem, which serves as a natural barrier against erosion, a habitat for various species, and a focal point for ecotourism and conservation programs that are gaining national and regional attention.

With its geographic characteristics and humid tropical climate, the island's buildings are exposed to environmental challenges such as high salt content in the air, seasonal heavy rains, and persistent sea breezes. These factors accelerate decay and physical deterioration, making routine maintenance and light restoration essential to ensure building functionality and user comfort. Furthermore, Tanjung Surat Island's profile as a destination promoted at the ASEAN Tourism Forum (ATF) 2025 places it in the international spotlight, requiring the preparation and upkeep of public facilities to present the best image to international visitors. This pertains not only to tourism infrastructure but also to community amenities that serve as hubs of social, educational, and cultural interaction. In line with these efforts, training and academic institutions also play a vital role. The Royal Malaysian Customs Academy (AKMAL), as the official training institution of the Royal Malaysian Customs Department (JKDM), has a reputation for building human resource capacity through intensive training programs, knowledge exchange, and networks of cooperation with multiple stakeholders. With its main center in Bukit Baru, Melaka, and branches in Sabah, Sarawak, Langkawi, and Rantau Panjang, AKMAL operates not only nationally but also develops

community-based programs, including field activities and local collaborations. Within the context of community service on Tanjung Surat Island, the support building used for community activities and field learning was selected for light restoration. This approach reflects synergy between the preservation of community infrastructure and AKMAL's institutional role in driving human development and social engagement. Maintenance of buildings in the village not only meets functional demands but also symbolizes shared concern in strengthening the resilience of coastal communities in facing environmental challenges, while supporting the vision of the island as a competitive flagship ecotourism destination at the ASEAN level.

LITERATURE REVIEW

1. Community-Based Ecotourism, Mangrove Conservation, And The Need For Supporting Infrastructure

Community-based tourism (CBT) in mangrove areas relies on ecosystem management, visitor education, and strengthening local livelihoods, all of which require adequate and well-maintained social infrastructure such as meeting halls, education centers, and public facilities for hosting field visits and training activities. Studies on mangrove communities show that resident participation in educational tourism increases literacy in mangrove biology and ecology, strengthens conservation attitudes, and spurs local resource-based economic innovation; however, visitor pressure and routine use of facilities create a need for disciplined preventive maintenance so that service functions remain optimal at all times (Nuraeni, 2023). More broadly, CBT literature in mangrove ecosystems underscores the reciprocal relationship between ecological sustainability and destination service quality: clean, safe, and comfortable infrastructure extends the length of stay, increases visitor satisfaction, and opens opportunities for more comprehensive field education curricula. This amplifies conservation impacts and socio-economic benefits, so relatively low-cost physical interventions such as light restoration and repainting of public facilities become high-value strategies in the destination maintenance cycle (Nuraeni, 2023).

2. Community-Based Ecological Mangrove Rehabilitation (CBEMR) And Its Relevance For Community Facilities

CBEMR emphasizes the need for careful ecological and social diagnosis prior to field action, highlighting restoration of hydrological processes and site conditions to enable natural regeneration, and facilitating stakeholder agreements (Brown, 2014). A key CBEMR finding is that success at small-to-medium scales increases when biophysical and socio-political issues are addressed simultaneously: for example, ensuring tidal flows and substrate quality while strengthening community institutions and area governance. In this context, community facilities—places for deliberation, learning, and storing equipment—play a critical role as enablers of the CBEMR process, and thus must be kept functionally and aesthetically maintained through routine upkeep (Brown, 2014). A similar approach is emphasized by a systematic review of community-based mangrove restoration: combinations of interventions (active restoration such as participatory planting; passive restoration through protection; business model development; and institutional strengthening) most consistently deliver ecological outcomes—improved biomass, water/soil quality, biodiversity—alongside increased community income. The study notes that institutional support and physical community facilities are prerequisites for sustained participation and long-term monitoring (Kusumadewi, 2024).

3. Effectiveness Of Community-Based Mangrove Management: Requirements For Quality Spaces And Amenities

Analyses of community-based mangrove management (CBMM) effectiveness show variations in practice and capacity that affect ecological performance of mangrove forests. Multi-site evaluations indicate that robust CBMM practices—including participatory planning, monitoring, and rule enforcement—are more successful at maintaining ecosystem function compared to sporadic approaches. Well-preserved ecosystems attract more intensive education and nature-based tourism programs, which in turn require readiness of supporting facilities that are comfortable and safe (Damastuti & de Groot, 2022; Damastuti *et al.*, 2023). On the other hand, stakeholder perceptions of CBEMR highlight that long-term success depends on consistent maintenance of amenities, meeting spaces, and education centers that serve as nodes of collective activity. Providing well-maintained spaces facilitates cross-group coordination, strengthens social trust, and enables joint field learning (Lhosupasirirat *et al.*, 2023).

4. Johor River Context And Coastal Pressure Dynamics

The Johor River is a large river system with connected mangrove ecosystems, including islands and coastal villages dependent on water access. Regional literature shows that mangrove deforestation in Johor is driven by

anthropogenic pressures, warranting rehabilitation and conservation strategies that position communities as core actors in oversight and education (Sarmin et al., 2016). Recent initiatives in Johor for mangrove conservation and restoration emphasize community-based approaches, cross-institutional collaboration, and strengthening the value chains of ecotourism and mangrove-based products. These activities commonly use community facilities as logistical and educational bases, making the physical condition of buildings and spatial comfort important supporting factors (Society for Ecological Restoration, 2024).

5. Regional Events And Destination Readiness: Implications For Facility Aesthetics And Service Life

The ASEAN Tourism Forum (ATF) 2025 series in Johor motivates destinations in the area, including technical visit sites, to uphold standards of visual cleanliness, safety, and facility comfort. Tourism literature emphasizes that destination readiness in the context of regional events involves not only flagship attractions but also supporting public facilities that are neat and resilient to local climate so that visitor experiences remain positive during periods of heightened visitation (Lhosupasirirat et al., 2023). In humid tropical coasts like Tanjung Surat, façade aesthetics and the durability of surface materials against salt spray, UV radiation, and mold have strategic value—both for sustaining destination image and for medium-term maintenance cost efficiency (Damastuti & de Groot, 2022).

6. Material Resilience And Building Maintenance In Coastal Environments

Damage to paint layers and metal components of coastal buildings is typically triggered by interactions of environmental factors: salinity, high humidity, UV radiation, wet-dry cycles, and air and water pollutants. Reviews of corrosion in coastal infrastructure emphasize that the corrosion rate of steel and the degradation of concrete and protective coatings increase in marine environments, making material strategies and preventive maintenance crucial—including selection of weather/UV-resistant exterior paint systems, anti-fungal agents, use of alkali-resisting primers on cementitious substrates, and anticorrosive primers for metal elements (Valdez et al., 2016). Coastal case studies show accelerated degradation in reinforced concrete through carbonation and chloride ion ingress, which can cause spalling of concrete cover and significant rebar mass loss over short time horizons. This strengthens the argument that preventive surface maintenance and early protection of metal components are important investments to extend the service life of public facilities in coastal areas (Rahman, 2024).

Recent studies on atmospheric corrosion of carbon steel in coastal regions also underscore sensitivity to relative humidity, salt deposition, and pollutants; the combination of these factors determines coating system performance, so repainting intervals and coating specifications need to be set based on local environmental risk (Guerra-Mera et al., 2024). At the asset management level, reviews of maintenance strategies for corrosion-exposed structures emphasize condition-based maintenance, integration of periodic inspections, and repainting policies based on coating performance to optimize life-cycle costs. Implementing standard procedures for surface salt removal, adequate drying before painting, and layered application schedules improves protection reliability in coastal environments (Abbas et al., 2020).

7. The Role Of Community Facilities As Hubs For Training And Service

In the context of training and capacity building, national training institutions like the Royal Malaysian Customs Academy (AKMAL) run curricula that include field components and multi-stakeholder collaboration. Regional WCO-level customs training literature highlights that effective learning often requires direct interaction with communities and real work environments, making representative, clean, and functional community facilities important for workshops, compliance outreach, and public education (WCO/AKMAL, 2019). This aligns with conservation literature findings that community capacity building—through training, mentoring, and participatory monitoring—is more effective when there are proper shared spaces for learning and coordination. Light restoration of support facilities—especially improving surface quality, lighting, and protection against coastal climate—becomes a prerequisite for sustained service-learning activities (Kusumadewi, 2024).

8. Connectivity Among Conservation, Ecotourism, And Facility Maintenance

Cross-disciplinary literature shows strong interlinkages between the success of community-based mangrove conservation, ecotourism performance, and public facility maintenance practices. On one hand, ecotourism provides economic incentives and public awareness for conservation; on the other, successful ecotourism requires safe, clean facilities adaptive to the coastal environment. Implementing appropriate coating systems and consistent maintenance schedules reduces long-term costs and supports the continuity of conservation programs and

environmental education (Valdez et al., 2016; Abbas et al., 2020). The literature also emphasizes aligning facility maintenance with regional event calendars and tourism seasons, so that maintenance interventions do not disrupt core activities and maximize positive visual impact at strategic moments, for example ahead of academic visits, training, or regional events. This approach is consistent with destination management practices and stakeholder recommendations in community-based ecological rehabilitation programs (Lhosupasirirat et al., 2023; Nuraeni, 2023).

9. Implications For Tanjung Surat: Strategies For Light Restoration And Repainting

Drawing from the above literature, light restoration for support buildings used for community and training activities in coastal villages like Tanjung Surat should follow these principles:

- Site diagnostics and environmental risk: identify the intensity of salt spray, humidity, and UV exposure to determine specifications for sealers, primers, and topcoats, as well as maintenance intervals (Valdez et al., 2016; Guerra-Mera et al., 2024).
- Adaptive coating systems: use alkali-resisting primer on cement/plaster substrates, weather/UV-resistant exterior paint with anti-fungal agents, and anticorrosive primer on metals; prioritize adequate drying and surface salt removal before application (Abbas et al., 2020).
- Maintenance scheduling: synchronize works with community activity periods and visitor seasons to minimize disruption and maximize aesthetic impact at peak moments (Nuraeni, 2023).
- Community engagement: make gotong royong a vehicle for service-learning; support it with safety modules, proper painting practices, and documentation for monitoring surface conditions over time (Kusumadewi, 2024; WCO/AKMAL, 2019).
- Conservation–ecotourism integration: use restored facilities as education hubs to reinforce conservation messages and low-impact tourism practices, creating positive feedback between infrastructure conditions and ecological program success (Brown, 2014; Nuraeni, 2023).

Contemporary scientific literature indicates that the success of community-based mangrove conservation and ecotourism is strongly supported by the availability of social facilities that function well, are safe, and are aesthetically pleasing. In coastal tropical environments, light restoration strategies—particularly appropriate paint systems—not only improve appearance but also increase surface service life and reduce life-cycle costs. Within the framework of training and service-learning collaborations involving institutions such as AKMAL and community partners, the maintenance of public facilities becomes a strategic component uniting the ecological, social, and economic objectives of destinations like Tanjung Surat (Brown, 2014; Damastuti & de Groot, 2022; Valdez et al., 2016).

METHOD

The method explains the design of activities, how to select the target audience, the materials and tools used, the design of the tools and their performance and productivity, data collection techniques, and data analysis techniques. [Times New Roman, 12, normal].

1. Measurement Of Work Volume

In-situ measurements were conducted to determine areas, substrate types (exterior–interior plaster, wood, metal), and field priorities based on coastal exposure; the measured 400 m² covers exterior–interior walls of the main building and the veranda to maximize protective and aesthetic impact. Material needs were derived from area, number of coats, and surface conditions exposed to salt spray and humidity.

2. Pre-Restoration Stages

- A color scheme consultation was held with village administrators referencing coastal culture, selecting blue–light blue tones aligned with maritime identity and the mangrove environment.
- Material system selection: weather/UV-resistant acrylic exterior paint with anti-fungal properties for exterior walls, low-VOC water-based paint for interiors, wall sealer/alkali-resisting primer to stabilize plaster pH, as well as anticorrosive primer (e.g., zinc phosphate/epoxy) and tropical weather topcoat for metal elements.
- Gotong royong was scheduled for weekends to minimize disruption to livelihoods of fishers and local ecotourism operators.

3. Restoration And Painting Process

- Cleaning: washing off surface salts, removing mold/algae with mild detergent and clean water rinses, adequate drying before application.
- Substrate repair: cement–polymer putty for hairline cracks, sanding, and application of anti-alkali sealer for adhesion and color stability.
- Coat application: at least two coats for interiors and three coats for exteriors with drying intervals per recommendations; rollers for broad surfaces, small brushes for corners/details; zig-zag top–bottom strokes for even coverage.

RESULTS AND DISCUSSION

The community service activity consisting of light restoration and repainting of the community support building in Kampung Tanjung Surat is an integrated initiative emphasizing community collaboration, technical sustainability, and socio-economic continuity. The activity focused on completing a total area of 400 m² covering exterior walls, interior walls, and the veranda. The volume of works achieved as targeted produced key outputs: enhanced protection of building surfaces in a coastal environment with high humidity and salt-laden air exposure, improved visual–thermal comfort, and facility readiness to host visits and service-learning following the ASEAN Tourism Forum (ATF) 2025 held in Johor. These results are highly relevant to Tanjung Surat Island's position as a consolidation of conservation–ecotourism now increasingly recognized at the regional level. The island even became one of the flagship locations visited by ATF 2025 delegates. In this context, the quality of building façades, visual cleanliness, and reliability of amenities function not only technically but also shape the destination's image and visitors' overall experience.

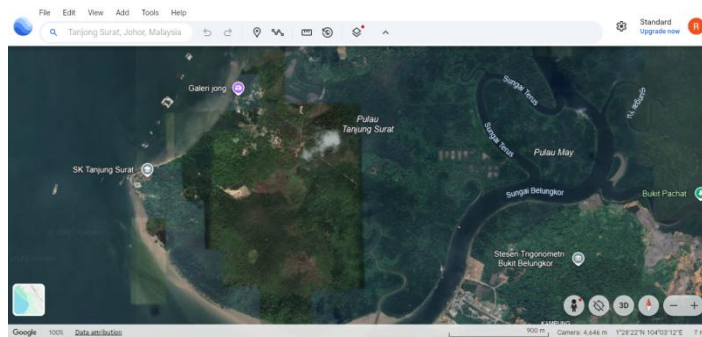


Figure 1. Map of Tanjung Surat Village, Johor, Malaysia

1. Physical Work Achievement

In terms of physical achievement, work began with preparation, namely cleaning surface salt layers, moss, mold, and salt dust adhering to walls and metal elements. This stage is crucial because high humidity and salt deposition are primary determinants of atmospheric corrosion rates in coastal areas. After thorough cleaning, adequate drying was conducted to ensure the substrate was ready to receive coatings, so the adhesion of anti-alkali sealer and topcoat could last optimally, as recommended in tropical exterior paint systems.





Figure 2. Group Photo of Participants

Application of sealer/primer was carried out meticulously. Cement and plaster substrates received alkali-resistant primer, while metal elements received anticorrosive primer. Painting was applied evenly with a minimum of two interior coats and three exterior coats, resulting in better resistance to UV exposure, extreme humidity, and daily salt deposition typical of the Johor River estuary. Care at this stage ensures medium- to long-term protection against coating damage and early corrosion of metallic components. The color scheme used—maritime tones (blue–light blue)—was agreed upon with community administrators. The color choice is not only aesthetic but also strategic. Blue, associated with the sea and mangroves, affirms the ecotourism identity of Tanjung Surat Island. In line with the momentum of ATF 2025 and Johor tourism promotion 2026, this color scheme is part of the destination’s visual branding strategy. Practically, this physical output can reduce the risk of coating degradation and extend repainting intervals, thus improving infrastructure life-cycle cost efficiency.

2. Impacts On Socio-Educational Function And Destination Readiness

The improved physical quality of the building directly impacts social and educational functions. Cleaner, tidier, and more comfortable community facilities are now suitable venues for meetings, training, and field visits. Tanjung Surat’s reputation as a center of community-based ecotourism, which received exposure during ATF 2025, is further strengthened because infrastructure quality enhances destination credibility. In addition, the success in welcoming delegations and gaining public exposure in an international forum creates positive feedback for local conservation and ecotourism efforts. Visitors and regional media directly experience service and infrastructure quality, ultimately increasing travel satisfaction and reinforcing narratives of community-based mangrove ecosystem recovery. The gotong royong process synchronized with weekends also adds value, as it does not disrupt local livelihoods. Instead, the activity serves as a service-learning vehicle that strengthens social cohesion after increased visitor traffic due to ATF 2025. The implications of this success go beyond the local scope to a regional context. The now-met standards of visual cleanliness and spatial comfort also reflect Tanjung Surat’s readiness to meet regional tourism expectations shaped by media and international forums. Thus, the physical outputs achieved are not merely building improvements but an important component in the destination positioning strategy.

3. Coating System Performance In A Coastal Context

Coastal environments pose unique challenges for building coating systems. The combination of marine salt deposition, high relative humidity, temperature fluctuations, and air pollutants accelerates coating deterioration. Therefore, early-stage success in cleaning, drying, and priming is crucial. These mitigation measures effectively slow the emergence of coating defects such as chalking, blistering, and delamination. The presence of anticorrosive primer on metal elements prevents early corrosion due to continuous attack by marine aerosols. Selection of weather- and UV-resistant paints and use of layered systems are consistent with global technical recommendations for coastal asset conservation. Although long-term monitoring remains necessary, the outcomes achieved in this project already reflect risk mitigation appropriate to the climate and intensity of space use in Tanjung Surat.

4. Linkages With AKMAL's Role And The Service-Learning Ecosystem

This activity cannot be separated from the role of AKMAL as a national training institution that frequently conducts field-based learning programs. Representative community facilities are important for AKMAL to conduct workshops, outreach, and cross-stakeholder collaboration. Aligning facility quality in Tanjung Surat further strengthens the service-learning ecosystem characteristic of community-based programs while meeting capacity-building demands highlighted by the ATF 2025 momentum. This integration means that the restored facility functions not only as physical infrastructure but also as a node of educational and collaborative activity. The effects are multi-layered: increased socio-economic benefits for residents, strengthened inter-institutional networks, and consolidated public trust in community ecotourism. Thus, this restoration activity delivers not only material results but also expands benefits toward institutional capacity and learning networks.

5. Lessons Learned And Maintenance Recommendations Going Forward

Despite encouraging achievements, long-term maintenance is critical to sustain the benefits. Follow-up recommendations include quarterly visual inspections to detect early signs of mold, surface salts, or coating defects. Routine light washing ahead of the rainy season or peak visitation is important for maintaining aesthetics and protective performance. Additionally, scheduling touch-up repainting in areas exposed to prevailing winds should be done consistently. Reapplication of anticorrosive treatment at metal joints and vulnerable edges ensures that visible material degradation can be minimized. These recommendations maintain facility quality across the destination's activity cycle, especially when facing major events or periodic visits. If maintenance consistency is applied, Tanjung Surat can maintain its reputation as Johor's flagship community-based ecotourism model while enhancing competitiveness within regional ecotourism networks. This aligns with the long-term target of positioning the area as an ecotourism hub that is not only environmentally sustainable but also socially and economically empowered. Overall, the restoration and repainting of Tanjung Surat's community facility can be considered successful in achieving three outcome dimensions:

- Technical — achieving coating protection quality adapted to coastal environmental challenges.
- Socio-educational — improved facility suitability for hosting visits, training, and cross-institutional collaboration.
- Destination — strengthened image of Tanjung Surat as a community-based ecotourism model aligned with the ATF 2025 momentum.

With these outputs, the community service activity not only produced a building that is more beautiful and durable but also strengthened social connectivity, conservation sustainability, and Johor's tourism promotion strategy in the eyes of regional and international audiences.

CONCLUSION

The community service program for light restoration and repainting of the support building used for community activities and field learning related to AKMAL in Kampung Tanjung Surat successfully addressed 400 m² of exterior–interior surfaces and the veranda through material strategies suited to the coastal environment and through gotong royong implementation. This activity supports the sustainable function of the facility for the community while enhancing destination readiness recognized within Johor's tourism and conservation agenda.

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