UJCS 7 (3) (2026)

Unram Journal of Community Service

https://jurnalpasca.unram.ac.id/index.php/UJCS

Empowering Coconut Crab (*Birgus latro*) a Captive-Rearing Group through Appropriate-Technology-Based Domestication in Gemia Village, Central Halmahera

Mufti Abdul Murhum[1]*, Waode Munaeni[1], Aqshan Sadikin Nurdin[2], Sri Endah Widiyanti[3]

[1] Department of Aquaculture, Faculty of Fisheries and Marine Sciences, Universitas Khairun, Ternate, North Maluku, Indonesia.
[2] Department of Forestry, Faculty of Agriculture, Universitas Khairun, Ternate, North Maluku, Indonesia.
[3] Department of Aquatic Resources Management, Faculty of Fisheries and Marine Sciences, Universitas Khairun, Ternate, North Maluku, Indonesia.

Article Info
Received : August 15, 2026
Revised: August 29, 2026
Accepted: September 18, 2026
Published: September 30, 2026

Corresponding Author:
Mufti Abdul Murhum
mufti@unkhair.ac.id

DOI: 10.29303/ujcs.v7i3.1841

Abstract: The coconut crab (*Birgus latro*) is an ecologically and economically valuable coastal resource whose exploitation still relies on wild stocks. This community service program aimed to strengthen the capacity of a coconut crab captive-rearing group and implement the Birgus Terra Box (BTB) as an appropriate technology for domestication in Gemia Village, Central Halmahera, Indonesia. A participatory approach included outreach, management training, hands-on BTB construction, husbandry, monitoring, record keeping, and evaluation. Outreach was conducted on 15 May 2026, training on 21 July 2026, BTB construction on 22–25 July 2026, and rearing began on 26 July 2026. Twenty-five BTB units were prepared, including 20 for juveniles and 5 for grow-out and broodstock care, in a 6 × 4 m rearing room. Initial husbandry used a 70:30 sand-clay substrate, fresh coconut meat as starter feed, and a 1:1 seawater-freshwater mixture. Group members participated directly in construction, operation, maintenance, monitoring, and logbook use. Because the 5–6-month rearing cycle remained ongoing, biological and economic outcomes were not treated as final. Early achievements comprised technology transfer, BTB infrastructure establishment, and initiation of standardized husbandry and traceable monitoring.

Keywords: *Birgus Latro*, Captive Rearing, Community Empowerment, Domestication, Appropriate Technology.

Introduction

The coconut crab (*Birgus latro* Linnaeus, 1767) is the world's largest terrestrial arthropod and a characteristic species of tropical islands in the Indo-Pacific. Adults are predominantly terrestrial, yet reproduction remains linked to the marine environment because ovigerous females release larvae into seawater and early development occurs in the sea (Ohashi et al., 2019; Serosero et al., 2020). This dual dependence on terrestrial and coastal habitats makes management of *B. latro* inseparable from habitat protection and sustainable harvesting. A recent global reassessment identified habitat loss and fragmentation, overharvesting, introduced predators, road mortality, and other human pressures as major threats, while field observations from Zanzibar similarly showed larger and more abundant individuals at sites with lower human pressure or stronger protection (Caro et al., 2021; Cumberlidge et al., 2022).

North Maluku is particularly relevant for coconut crab domestication because *B. latro* remains an important local resource and several studies have documented its habitat and population characteristics in the region. Research in Ternate, West Halmahera, Morotai, and Hiri Island indicates that substrate characteristics, vegetation cover, temperature, humidity, and proximity to human activity are associated with coconut crab occurrence, size distribution, and habitat use (Serosero et al., 2016, 2018a, 2018b, 2023). These

How to Cite:
Murhum, M. A., Munaeni, W., Nurdin, A. S., & Widiyanti, S. E. Empowering Coconut Crab (Birgus latro) a Captive-Rearing Group through Appropriate-Technology-Based Domestication in Gemia Village, Central Halmahera. *Unram Journal of Community Service*, *7*(3), 264–272. https://doi.org/10.29303/ujcs.v7i3.1841

findings imply that controlled rearing should reproduce key microhabitat functions rather than merely confine animals in containers. Shelter, substrate, ventilation, moisture, access to water, and ease of cleaning are therefore important design considerations.

Previous domestication and captive-rearing studies provide a technical basis for individual husbandry. Early trials demonstrated that *B. latro* can be maintained under controlled conditions, although low survival in initial experiments indicated that husbandry still required refinement (Sulistiono et al., 2007). Subsequent work using individual compartments equipped with shelter and access to freshwater and seawater reported survival of approximately 82–83% during the observation period (Sulistiono et al., 2009). More recent captive feeding trials used individual boxes with shelter and separate feed, freshwater, and seawater containers and reported 80–100% survival across dietary treatments (Sulistiono et al., 2022). These studies support individual separation, escape prevention, shelter provision, and manageable microhabitats as practical components of domestication systems.

Feed quality is another critical component. *B. latro* is omnivorous and can assimilate a wide range of plant- and animal-derived food sources (Wilde et al., 2004). Coconut is locally available and biologically familiar, but acceptance of a food item does not demonstrate nutritional adequacy. Murhum et al. (2019) showed that coconut crabs accepted formulated diets and exhibited different molting responses among feed formulations, while Murhum et al. (2025) found that coconut-meal inclusion affected fatty-acid profiles and digestive enzyme responses in controlled environments. Recent larval work also indicates that dietary lipid quality can influence larval performance, emphasizing that nutritional requirements may vary across developmental stages (Sawada et al., 2025).

The captive-rearing group in Gemia Village faced practical constraints that included limited knowledge of domestication techniques, suboptimal rearing containers, escape risk, insufficient shelter and spatial organization, unstructured feed and water management, and inconsistent monitoring and record keeping. For this reason, the program combined technology introduction with hands-on capacity building. Comparable aquaculture community-service activities have shown the value of direct demonstration and repeated practical engagement for building operational skills (Malan et al., 2024; Munaeni et al., 2022), while broader studies of aquaculture adoption identify extension participation, technical skills, and ease of understanding as important determinants of technology uptake (Mardiyah et al., 2026; Obiero et al., 2019). Continuous assistance can also strengthen the sustainability of technology-based coastal empowerment (Saparita et al., 2020), and community partnerships are especially relevant where livelihood improvement is linked to conservation of locally important biological resources (Nurdin et al., 2025).

Accordingly, the program introduced the Birgus Terra Box (BTB) as an appropriate technology that functions simultaneously as a rearing facility and a learning platform. The objectives were to: (1) strengthen the group's knowledge and practical skills in *B. latro* domestication; (2) implement BTB units for more controlled individual rearing; (3) improve management of feed, water, substrate, and container hygiene; (4) establish a routine monitoring and record-keeping system; and (5) create an initial foundation for community-based and conservation-oriented coconut crab rearing. This article reports the early implementation and empowerment outcomes only. Biological effectiveness and economic feasibility are not concluded because a complete rearing cycle had not finished when the manuscript was prepared.

Method

Location and Implementation Period

The program was conducted in Gemia Village, Central Halmahera Regency, North Maluku Province, Indonesia, in 2026. The main implementation site was a 6 × 4 m rearing room owned and managed by the captive-rearing group. One rearing cycle was projected to last approximately 5–6 months and was scheduled for completion in December 2026.

Table 1. Program stages and implementation schedule

Program stage	Date/period
Community outreach and initial capacity strengthening	15 May 2026
Captive-rearing management training	21 July 2026
BTB construction and arrangement	22–25 July 2026
Start of rearing and monitoring	26 July 2026
Continued rearing and monitoring	July–December 2026

Participatory Empowerment Approach

The program used a participatory sequence of problem identification → community outreach → training → hands-on construction → BTB implementation → husbandry → monitoring → record keeping → evaluation. The captive-rearing group was positioned as the principal operator of the technology, while the community-service team acted as facilitator for knowledge strengthening, demonstration, technical assistance, and development of the monitoring system.

Community outreach involved village government representatives, community leaders, and the captive-rearing group. The material covered *B. latro* biology and habitat, conservation, domestication principles, container management, feed, water, hygiene, monitoring, and record keeping. This stage was followed by management training and direct practice in constructing, arranging, and operating BTB units.

Construction and Implementation of the Birgus Terra Box

Twenty-five BTB units were prepared, comprising 20 units for juveniles and 5 units for grow-out and broodstock care. The units were arranged in the 6 × 4 m rearing room and supported by ventilation, shelter, feeding and water areas, racks, lighting, access control, and substrate. The substrate consisted of 70% sand and 30% clay. The BTB was designed for individual rearing to reduce direct interaction among crabs and to facilitate identification, husbandry, and monitoring.

Figure 1. Functional schematic of the Birgus Terra Box (BTB) for individual coconut crab rearing, showing shelter/resting, feeding, and water zones, ventilation, and one-crab-per-unit capacity. Source: PKM Team design, 2026. Dimensions are illustrative and do not indicate that all field units were identical.

Table 2. BTB implementation components in Gemia Village

Component	Implementation/ Configuration
Total BTB units	25
Juvenile BTB units	20
Grow-out/broodstock BTB units	5
Rearing room	6 × 4 m
Substrate	70% sand + 30% clay
Initial feed	Fresh coconut meat
Water	50% seawater + 50% freshwater
Monitoring	Initiated
Logbook	Initiated

For communication and training purposes, the BTB concept was represented as three functional zones: a shelter/resting zone occupying approximately 70% of the unit, a feeding zone of approximately 15%, and a water zone of approximately 15% (Figure 1). The schematic also illustrates ventilation, a mesh/ventilated lid, a horizontal divider, and one individual per unit. The illustrative dimensions of 30 × 20 × 30 cm describe functional proportions and do not indicate that all 25 field units were identical in size.

Husbandry and Maintenance

During the initial implementation, fresh coconut meat was used as starter feed, and water was prepared as a 1:1 mixture of seawater and freshwater. Containers were cleaned and feed and water were replaced every four days; this schedule is the operational reference for the implementation reported here. Fresh coconut was selected as a simple locally available starter practice. Its nutritional adequacy, and the suitability of the mixed-water configuration, were not assumed and remain subject to biological and environmental evaluation.

Biological, Environmental, and Logbook Monitoring

Environmental monitoring included water temperature, pH, salinity, room temperature, and humidity. Biological monitoring included carapace length, body weight, individual condition, and status as alive, dead, or escaped. Growth measurements were scheduled every 30 days. Detailed environmental monitoring frequencies were being standardized while data collection continued.

Each husbandry activity was entered in a logbook linking the BTB identity with the individual crab. Records included feeding, water and environmental condition, growth, mortality, escape events, maintenance actions, and technical constraints. This system was established to create a longitudinal dataset that can be audited during the final evaluation.

Table 3. Monitoring and record-keeping parameters

Parameter group	Variables
Environment	Water temperature, pH, salinity, humidity, room temperature
Biological	Carapace length, body weight, individual condition, alive/dead/escaped status
Husbandry	Feeding, water condition, cleanliness, maintenance actions
Special events	Mortality, escape events, technical constraints

Data Analysis

Data available at manuscript preparation were analyzed descriptively to document program implementation, technology deployment, group participation, husbandry practices, and readiness of the monitoring and record-keeping system. Growth, survival, productivity, production cost, profit, R/C ratio, and break-even point (BEP) were not analyzed as final outcomes because the rearing cycle was still in progress. Partial observations were therefore not used to infer biological effectiveness or economic feasibility.

Result and Discussion

Community outreach and Initial Capacity Strengthening

Community outreach was conducted on Friday, 15 May 2026, at the Gemia Village Office. The activity introduced the purpose of the program and positioned domestication within a broader framework of coconut crab management. Topics included resource status, domestication principles, container and environmental management, feed and water management, conservation, monitoring, and record keeping. This stage established a common operational understanding before the group entered the construction and husbandry phases.

The defensible outcome at this stage was initial readiness to participate in technical activities, rather than a quantitatively demonstrated increase in capacity. Attendance or active discussion alone cannot be treated as evidence of learning. A stronger capacity claim would require pre- and post-assessment, competency rubrics, or observation of independent performance. This distinction is consistent with Mardiyah et al. (2026), who found that extension methods can improve knowledge and skills but do not automatically translate into technology adoption.

Figure 2. Community outreach and initial capacity strengthening at the Gemia Village Office: (a) presentation of technical material; (b) participants and local stakeholders. Source: PKM Team documentation, 2026.

Management Training and Construction Assistance

Management training was conducted on 21 July 2026 at the group leader's residence. The targeted competencies included identification of materials and tools, BTB assembly, recognition of male and female crabs, basic health and disease management, and response procedures when an animal escaped. Assembly and arrangement continued at the rearing site from 22 to 25 July 2026.

The hands-on format was intended to move technology transfer beyond conceptual understanding. Community-based aquaculture training in North Maluku has likewise used demonstration, direct practice, and husbandry participation to build operational skills (Malan et al., 2024; Munaeni et al., 2022). This approach is also supported by evidence that extension participation and ease of understanding are positively associated with aquaculture technology adoption (Obiero et al., 2019), while sustained assistance can strengthen the practical use of technology in coastal communities (Saparita et al., 2020). In Gemia, group members did not merely receive completed units; they participated in material preparation, assembly, arrangement, and operation.

Figure 3. Captive-rearing management training: (a) technical instruction; (b) group discussion. Source: PKM Team documentation, 2026.

Figure 4. Assistance with BTB construction and arrangement: (a–b) preparation of components and substrate; (c–d) arrangement of units in the rearing room. Source: PKM Team documentation, 2026.

Implementation of BTB as an Appropriate Technology

All 25 BTB units were prepared and entered the initial implementation phase: 20 units for juveniles and 5 units for grow-out and broodstock care. The units were arranged in the 6 × 4 m rearing room and equipped with the supporting components required for shelter, feed, water, ventilation, substrate, and unit identification. The conceptual layout is presented in Figure 1, whereas the configuration actually used by the group is documented in Figure 5. Distinguishing the schematic from field documentation prevents an illustrative design from being interpreted as measured performance data.

Individual rearing is consistent with earlier captive-maintenance approaches. Sulistiono et al. (2009) used one crab per compartment with shelter and access to freshwater and seawater, and Sulistiono et al. (2022) used individual boxes with shelter and separate feed and water containers. The BTB translates these principles into a locally manageable format. However, differences in unit dimensions, materials, ventilation, substrate, water management, and local microclimate mean that the biological performance of BTB cannot be inferred from earlier studies and must be established from the program's own monitoring data.

At this stage, the most evident practical value of BTB was organizational: each crab could be managed as an identifiable unit, with designated microhabitat, feeding, and water areas and a corresponding record in the logbook. In the context of community service, appropriate technology is therefore understood not simply as a physical product but as a system that local users can learn, operate, maintain, monitor, and improve.

Figure 5. Field implementation of the BTB: (a) BTB unit; (b) lid ventilation; (c) example unit arranged with substrate, shelter, feed, water, and one coconut crab. Source: PKM Team documentation, 2026.

Feed and Rearing Environment

Fresh coconut meat was selected as the initial feed because it was locally available and simple for the group to handle. This choice is compatible with the omnivorous feeding ecology of *B. latro* (Wilde et al., 2004) and with earlier captive studies in which coconut was accepted (Sulistiono et al., 2007, 2009). Nevertheless, food acceptance should not be equated with nutritional adequacy. Murhum et al. (2019) showed that formulated feeds can be accepted by coconut crabs and may influence molting responses, while Murhum et al. (2025) demonstrated that coconut-meal levels affect fatty-acid profiles and digestive enzyme responses. Diet quality also affects performance at the larval stage (Sawada et al., 2025). Fresh coconut should therefore be regarded as a starter practice rather than a final feed formulation.

The program used a 1:1 mixture of seawater and freshwater. This differs from captive systems that provided the two water sources separately (Sulistiono et al., 2009, 2022), and the difference is scientifically important. The mixed-water configuration is a local implementation choice that requires evaluation through salinity, pH, temperature, crab behavior, and health observations. It should not be assumed to be equivalent to earlier husbandry systems.

The 70:30 sand-to-clay substrate was likewise an operational configuration rather than an experimentally optimized ratio. Studies in North Maluku show that *B. latro* occupies habitats with variation in substrate, vegetation, humidity, and other microclimatic conditions (Serosero et al., 2016, 2018a, 2018b, 2023). Monitoring of moisture, digging behavior, cleanliness, and individual condition is therefore necessary before the substrate ratio can be recommended beyond this program.

Monitoring and Logbook as a Basis for Data-Driven Management

The introduction of routine monitoring and a logbook was a central early achievement because it shifted husbandry from largely experience-based practice toward traceable management. The group began recording BTB identity, individual identity, feeding, water and environmental conditions, changes in size, mortality, escape events, maintenance actions, and technical problems. Monthly growth measurements were planned to create a longitudinal record across the rearing cycle.

Table 4. Evaluation status at manuscript preparation

Indicator	Status	Permissible interpretation
Community outreach and training	Initial stage completed	Program purpose and basic operational skills introduced
BTB construction	25 units available	Technology physically implemented
Operation/husbandry	Ongoing	Group has begun using the system
Monitoring and logbook	Initiated	Initial traceable record system established
Growth	Data being collected	Not yet a final outcome
Survival/mortality	Data being collected	Insufficient to judge BTB effectiveness
Productivity	Not yet available	Requires completion of one cycle
Economic feasibility	Not yet available	Requires complete cost and production data

These data will allow calculation of weight gain, carapace-length increment, growth rate, survival, duration of rearing, and productivity after the cycle is completed. At the present stage, however, the existence of 25 units, completion of training, or short-term persistence of individuals is insufficient evidence of biological effectiveness. Table 4 therefore distinguishes completed implementation outputs from indicators that remain under evaluation.

Technology Transfer and Group Capacity

The empowerment process can be represented operationally as know → understand → practice → operate → monitor → record. This is a process framework rather than a quantified success score. The observed evidence is that group members participated in construction, arrangement, operation, routine maintenance, monitoring, and record keeping.

This progression is consistent with evidence that practical skills are critical to technology adoption. Mardiyah et al. (2026) identified technical skills as an important pathway linking extension to aquaculture technology adoption, while Munaeni et al. (2022) documented a direct-practice approach for transferring aquaculture management skills in a community-service setting. Similar community-partnership models have combined conservation-oriented livelihood activities with local participation (Nurdin et al., 2025). Because no pre-test/post-test or quantitative competency rubric was used in Gemia, "capacity strengthening" is interpreted cautiously as an expansion of the group's operational role rather than as a measured change in competency.

Biological and Economic Evaluation: Current Status and Boundaries

Biological data were still being collected when this article was prepared. Final evaluation will use initial body weight and carapace length, monthly measurements, survival status, mortality, escape events, environmental conditions, rearing duration, and final size. These variables are required to distinguish successful technology installation from successful biological rearing. The cautious interpretation is also supported by Sulistiono et al. (2022): high survival under a dietary treatment does not by itself establish growth or molting performance when those outcomes are not observed.

Program baseline records from 2025 reported a local selling price of approximately IDR 150,000 per crab and traditional catches of about 4–10 crabs per trip at roughly three trips per month (Universitas Khairun, 2025). These figures are presented only as local economic context; they are not BTB revenue or profit data. A valid feasibility analysis requires complete information on BTB investment, construction, feed, labor, water, electricity, transport, maintenance, mortality, rearing duration, harvest volume, and selling price. Production cost, profit, R/C ratio, and BEP will therefore be calculated only after the first production cycle is complete.

Conservation Implications and Program Limitations

Domestication should be developed within a conservation and sustainable-use framework rather than solely as a production strategy. Global assessments show continuing pressure on coconut crab populations from harvesting and habitat change (Caro et al., 2021; Cumberlidge et al., 2022), while reproductive studies from North Maluku emphasize the importance of protecting mature individuals and maintaining access between terrestrial and coastal habitats (Serosero et al., 2020). In Gemia, domestication should therefore avoid increasing the collection of juveniles or broodstock from the wild. Future development should incorporate local rules for sourcing animals, protection of reproductive individuals, habitat safeguards, and population monitoring. A community-partnership model can be particularly useful when economic use and conservation need to be managed together (Nurdin et al., 2025).

The main limitation of this article is that the rearing period had not reached one full cycle. Environmental, growth, survival, productivity, and economic datasets were therefore incomplete. In addition, changes in group knowledge and skills were not measured using a formal before-and-after instrument, and no comparative rearing treatment was available for evaluating the technical superiority of BTB. Consequently, the present article is limited to early implementation outputs, group participation, establishment of husbandry procedures, and readiness of monitoring and record keeping. The final evaluation should integrate biological, technical, economic, and capacity indicators and use the findings to refine the BTB design, water system, substrate, feed, cleaning schedule, monitoring protocol, and standard operating procedures.

Conclusion

The Gemia Village community-service program achieved the initial implementation of coconut crab domestication using the Birgus Terra Box as an appropriate technology. Twenty-five units were established—20 for juveniles and 5 for grow-out and broodstock care—and the captive-rearing group participated directly in construction, arrangement, operation, maintenance, monitoring, and logbook use. Initial husbandry procedures for feed, water, substrate, hygiene, biological monitoring, and environmental monitoring were also established.

At this stage, the strongest outcomes are technology transfer, availability of BTB infrastructure, and establishment of a traceable husbandry and monitoring system. Biological effectiveness and economic feasibility cannot yet be concluded because the 5–6-month rearing cycle is incomplete. Final assessment after December 2026 should quantify growth, survival, mortality, escape events, productivity, cost, profit, R/C ratio, and BEP; it should also include a formal evaluation of group competency. Further development should remain explicitly conservation-oriented so that improved captive-rearing capacity does not increase harvesting pressure on wild *B. latro* populations.

Acknowledgments

The authors gratefully acknowledge the Ministry of Higher Education, Science, and Technology of the Republic of Indonesia and Universitas Khairun for supporting the 2026 Community Service Program under Main Contract No. 156/C3/DT.05.00/PM/2026 dated 13 April 2026 and Derivative Contract No. 284/UN44.L1/PM.08/2026 dated 27 April 2026. The authors also thank the Gemia Village Government and the coconut crab captive-rearing group for their participation and cooperation throughout the program.

References

Caro, T., Hamad, H., Rashid, R. S., Kloiber, U., Morgan, V. M., Nokelainen, O., Caro, B., Pretelli, I., Cumberlidge, N., & Borgerhoff Mulder, M. (2021). A case study of the coconut crab *Birgus latro* on Zanzibar highlights global threats and conservation solutions. Oryx, 55(4), 556–563. https://doi.org/10.1017/S0030605319000863

Cumberlidge, N., Caro, T., Watson-Zink, V. M., Naruse, T., Ng, P. K. L., Orchard, M., Rahayu, D. L., Wowor, D., Yeo, D. C. J., & White, T. (2022). Troubled giants: The updated conservation status of the coconut crab (*Birgus latro*). The Raffles Bulletin of Zoology, 70, 1–21. https://doi.org/10.26107/RBZ-2022-0001

Malan, S., Munaeni, W., Samadan, G. M., Syazili, A., Ahmad, K., Suryani, S., Darsan, I. M., Aris, M. A., Tamrin, T., Murhum, M. A., & Daud, A. H. (2024). Peningkatan kapasistas masyarakat di Desa Ake Dotilou melalui budidaya ikan sistem bioflok. Jurnal Pengabdian kepada Masyarakat Nusantara, 6(1.1), 613–620. https://ejournal.sisfokomtek.org/index.php/jpkm/article/view/5169

Mardiyah, A., Baskoro, M. S., & Yapanto, L. M. (2026). Pengaruh metode penyuluhan perikanan terhadap adopsi teknologi dan produktivitas nila bioflok Sipanen di Kota Bogor. Jurnal Penyuluhan Perikanan dan Kelautan, 20(1), 33–49. https://doi.org/10.33378/jppik.v20i1.648

Munaeni, W., Aris, M., Darsan, I. M., Labenua, R., & Disnawati. (2022). Sosialisasi dan pelatihan teknologi budidaya ikan nila sistem bioflok pada Kelompok Usaha Bersama. Jurnal Abdi Insani, 9(4), 1830–1838. https://doi.org/10.29303/abdiinsani.v9i4.797

Murhum, M. A., Hariyati, A. M., Yuniarti, A., & Prihanto, A. A. (2025). Fatty acid profiles and digestive enzyme responses of *Birgus latro* at developmental stages fed artificial diets with varying coconut meal levels in controlled environments. Egyptian Journal of Aquatic Biology and Fisheries, 29(1), 2371–2381. https://doi.org/10.21608/ejabf.2025.413548

Murhum, M. A., Wahono, B., & Widiyanti, S. E. (2019). Stimulation of molting on coconut crabs (*Birgus latro*, Linnaeus 1767) with artificial feed enriched fitoekdisteroid. Jurnal Sumberdaya Akuatik Indopasifik, 3(1), 57–64. https://doi.org/10.46252/jsai-fpik-unipa.2019.Vol.3.No.1.66

Nurdin, A. S., Irmayanti, L., Wahyuni, S., Pora, M. F., Sangadji, M. A., & Hasan, M. Z. F. (2025). Kemitraan komunitas dalam konservasi dan pemanfaatan lebah *Trigona* pada Kelompok Tani Hutan Molekat Mai Birahi Kota Tidore Kepulauan. Kumawula: Jurnal Pengabdian Kepada Masyarakat, 8(2), 423–430. https://doi.org/10.24198/kumawula.v8i2.57765

Obiero, K. O., Waidbacher, H., Nyawanda, B. O., Munguti, J. M., Manyala, J. O., & Kaunda-Arara, B. (2019). Predicting uptake of aquaculture technologies among smallholder fish farmers in Kenya. Aquaculture International, 27, 1689–1707. https://doi.org/10.1007/s10499-019-00423-0

Ohashi, K., Hamasaki, K., Dan, S., & Kitada, S. (2019). Artificial incubation and hatching of embryos of the coconut crab *Birgus latro* (Decapoda: Anomura: Coenobitidae). Crustacean Research, 48, 1–10. https://doi.org/10.18353/crustacea.48.0_1

Saparita, R., Surachman, D. N., Astro, H. M., Sukirno, S., & Apriliyadi, E. K. (2020). Sustainable community development for developing of coastal areas in Alor Regency, East Nusa Tenggara, Indonesia. Jurnal Pemberdayaan Masyarakat: Media Pemikiran dan Dakwah Pembangunan, 4(2), 367–390. https://doi.org/10.14421/jpm.2020.04-05

Sawada, S., Hamasaki, K., & Dan, S. (2025). Effects of dietary n-3 highly unsaturated fatty acids on larval performance in the coconut crab *Birgus latro* (Linnaeus, 1767) (Decapoda: Anomura: Coenobitidae). Journal of Crustacean Biology, 45(4), ruaf062. https://doi.org/10.1093/jcbiol/ruaf062

Serosero, R. H., Abubakar, Y., Subur, R., Sabar, M., Saman, Fadel, A. H., Rina, Widiyanti, S. E., & Abubakar, S. (2023). Size distribution and habitat characteristics of coconut crabs (*Birgus latro*) in Tomajiko, Hiri Island District, Ternate City, North Maluku Province. Jurnal Biologi Tropis, 23(2), 378–384. https://doi.org/10.29303/jbt.v23i2.6257

Serosero, R. H., Suryani, S., & Rina, R. (2016). Karakteristik habitat dan pola pertumbuhan kepiting kelapa (*Birgus latro*) di Pulau Ternate dan Kabupaten Halmahera Barat Provinsi Maluku Utara. Depik, 5(2), 48–56. https://doi.org/10.13170/depik.5.2.4350

Serosero, R., Sulistiono, Butet, N. A., & Riani, E. (2018a). Morphometric characteristics of coconut crabs (*Birgus latro* Linnaeus, 1767) in North Moluccas Province, Indonesia. AACL Bioflux, 11(5), 1616–1632.

Serosero, R., Sulistiono, Butet, N. A., & Riani, E. (2018b). Distribusi spasial dan temporal kepiting kelapa (*Birgus latro* Linn 1767) di Daeo Kabupaten Pulau Morotai, Maluku Utara. Jurnal Ilmu Pertanian Indonesia, 23(3), 211–219. https://doi.org/10.18343/jipi.23.3.211

Serosero, R., Sulistiono, Riani, E., & Butet, N. A. (2020). Reproduction of coconut crabs (*Birgus latro*) in Daeo District, Morotai Island, North Maluku, Indonesia. AACL Bioflux, 13(4), 2002–2013.

Sulistiono, Affandi, R., Wildan, D. M., Jusadi, D., Samson, S., Akmal, S. G., Yonvitner, & Patoka, J. (2022). Artificial feeding of *Birgus latro* (L., 1767) (Anomura: Coenobitidae) as an alternative to natural diet: Perspective for conservation breeding. Scientia Agriculturae Bohemica, 53(2), 33–39. https://doi.org/10.7160/sab.2022.530203

Sulistiono, Kamal, M. M., & Butet, N. A. (2009). Preliminary study on the coconut crab (*Birgus latro*) rearing in captive pond. Jurnal Akuakultur Indonesia, 8(1), 101–107. https://doi.org/10.19027/jai.8.101-107

Sulistiono, Refiani, S., Tantu, F. Y., & Muslihuddin. (2007). Preliminary study on domestication of coconut crab (*Birgus latro*). Jurnal Akuakultur Indonesia, 6(2), 183–189. https://doi.org/10.19027/jai.6.183-189

Universitas Khairun. (2025). Profil usaha penangkapan dan penjualan kepiting kelapa di wilayah Patani dan Patani Utara [Internal community-service program document].

Wilde, J. E., Linton, S. M., & Greenaway, P. (2004). Dietary assimilation and the digestive strategy of the omnivorous anomuran land crab *Birgus latro* (Coenobitidae). Journal of Comparative Physiology B, 174, 299–308. https://doi.org/10.1007/s00360-004-0415-7