

Blue Halo S – Blue Ecosystem Adaptation Mechanism (BEAM)

ANNEX 24: Adaptation Beneficiary Calculations

This document describes the methodology for the calculation of direct and indirect beneficiaries for the Blue Halo S - Blue Ecosystem Adaptation Mechanism (BEAM) Project.

1. Approach

The beneficiary calculation for the project differentiates between direct and indirect beneficiaries. **Direct beneficiaries** refer to individuals who have improved climate resilience due to Project interventions and directly receive support, services, financing, capacity building, technologies, or other interventions funded by the Project and/or its on-grant interventions. Direct beneficiaries are geographically bound within the coastal area adjacent to fishery area WPP 572, which is an extensive region across six provinces on the western coast of Sumatra.

BEAM's direct beneficiaries are facing impacts on their livelihoods, health, and well-being due to the impacts of climate change. For coastal populations in provinces adjacent to WPP 572, the primary climate drivers are increasing Sea Surface Temperatures, increasing Sea Level Rise, and increased frequency of extreme precipitation events. These changes lead directly to impacts on local populations including lower fisheries and aquaculture productivity, ecosystem degradation (leading to further decreases in marine productivity), and higher erosion and runoff rates (further degrading ecosystems and economic activity). Please see Section B.2 of the FP and the Annex 02 Climate Change Vulnerability Assessment (CCVA) for additional detail. BEAM seeks to address these impacts through Locally Led Climate Action, with interventions designed and implemented by beneficiaries who have the best understanding of their needs and the approaches to deliver sustainable results.

The number of direct beneficiaries is estimated in this document through analysis of the potential grant sizes for each proposed Activity / grant sub-window. These grant categories and sizes were collaboratively designed with participating communities and vulnerable groups within those populations to address the most relevant / critical impacts on coastal communities, identified through extensive stakeholder consultations (see **Annex 07**). The selection of grantees during implementation is aimed at ensuring maximum impact while addressing the needs of beneficiary populations. Given the on-granting nature of the Project with applications solicited and funded during Project implementation, impact distribution (number / size of grants and beneficiaries per category listed below) will vary depending on the specific interventions designed by beneficiaries and funded by the Project.

Adaptation and Mitigation grants issued under Component 2 will require (and Project partners will support development of) grantees' estimates of climate impacts and the number of beneficiaries (individuals or households) targeted in each grant proposal. Applicants will also be required to establish monitoring and reporting systems to track impact achieved and report back to the BEAM Project PMU for aggregation and reporting to the AE and GCF. The Grants Manual (**Annex 27**) and Eligibility Criteria (**Annex 26**) include additional information on the grants to be issued and how the Executing Entity will seek to ensure achievement of the overall targets indicated in this document.

Indirect beneficiaries are those people/groups who are not directly targeted by the Project but will benefit from Project interventions. Indirect beneficiaries of BEAM are individuals working in or relying on blue economy sectors related to marine capture fisheries, mariculture, and marine ecotourism within coastal villages across Indonesia. These beneficiaries are expected to benefit from the implementation and operationalization of BEAM-supported enabling mechanisms, including improved policy, regulatory, institutional, and financing conditions in the coastal and marine fisheries sector. These enabling mechanisms include: Public-Private Partnership (PPP) mechanisms and related policy reforms for MPA and coastal management under Component 1; and (ii) strengthened access to climate-responsive concessional finance through BLU LPMUKP system improvements under Component 2. Indirect beneficiaries are located across all coastal villages in Indonesia, not limited to the six provinces adjacent

to WPP 572. This national scope reflects the potential for policy reforms and innovative financing mechanisms developed under BEAM to be adopted and replicated across Indonesia's coastal and marine fisheries sector. Please see further description of Indirect beneficiaries methodology in section 4 of this document.

The climate change adaptation causal pathway is illustrated in the table on the following page. For each of the main climate impacts, the table shows the adaptation mechanisms that each relevant activity is designed to deliver and the types of resilience benefits that will result. Further detail on the adaptation benefits expected from each activity is provided in the tables in Section 3 that present the detailed estimations of beneficiaries.

Climate Impact	Primary BEAM Activities (titles modified for table)	Adaptation - Mechanisms	Resilience Benefits
Increasing SST leading to declining fish stocks and habitat degradation	Activity 1.1.1: Policy reforms to create enabling conditions for improved fisheries management and financing Activity 1.1.2: Improved fisheries data systems and stock assessments Activity 1.1.3: Knowledge management and learning Activity 2.1.1: Grants to promote and sustain fishing livelihoods; grants for collaborative MPA management	Increase sustainable financing for MPA creation and management allowing for more, larger, and better managed MPAs Strengthen fisheries management capacity for government and local communities Improve knowledge of climate risks and adaptive solutions for governments, fishers, and coastal communities Improve climate-responsive fisheries management through improved data and monitoring, facilitating quota-based fisheries and reduced overfishing of key species Increase capacity of small scale fishers and aquaculture operators to sustain catches / harvest	More sustainable fish stocks leading to improved food security and increased livelihood stability for fishers Improved income opportunities for women in fisheries (co-benefit) Adoption of climate adaptive practices and innovations to build resilience
SLR leading to increased coastal flooding, erosion, and storm impacts	Activity 1.1.1: MPA expansion and enhanced protection / enforcement Activity 2.1.1: Grants for waste management; grants for collaborative MPA management Activity 2.2.1: Grants for mangrove and seagrass conservation and restoration	Conservation and restoration of critical coastal ecosystems within MPAs Reduced pollution and runoff during extreme precipitation events, flooding, and storm surges Conservation and restoration of coastal community ecosystems, strengthening fish stocks and aquaculture viability	Increased food and water security for coastal communities from reduced saline intrusion and larger fish stocks Increased income / economic productivity for tourism operators and fishers Reduced exposure to flooding and erosion / coastal protection (not measured by the Project);
SST, SLR, and extreme precipitation leading to degradation of mangroves, seagrasses, and coral-linked habitats	Activity 1.1.1: Strengthened coastal / marine regulations and enforcement Activity 2.1.1: Grants for waste management; grants for collaborative MPA management Activity 2.2.1: Grants for ecosystem conservation and restoration	Better protection and management of MPAs and other target areas leading to improved fisheries health Reduced pollution / waste deposition / sedimentation during storm events Improved community management of key coastal ecosystems	Improved food security and livelihoods for fishers Improved tourism and other economic opportunities Improved biodiversity and habitat quality (co-benefit) Reduced GHG emissions (mitigation benefit)
SST and SLR leading to reduced and unstable fisheries-based incomes	Activity 1.1.2: Improved fisheries data to enable improved management Activity 1.1.3: Knowledge management and learning Activity 2.1.1: Grants for ecotourism; grants for diversified fisheries livelihoods Activity 2.2.1: Grants for deployment of green technology Activity 2.3.1: Improved access to finance	Improved data allow for better fisheries management and more sustainable fish stocks Better availability of information on climate change, its impacts, and innovations to support resilience in coastal communities Investments in sustainable, diversified livelihoods that respond directly to beneficiary needs Provision of solar chillers to reduce spoilage and increase catch value Improved growth opportunities for local fisheries businesses	Improved and more resilient household incomes for fishers and tourism operators Improved knowledge and utilization of climate and fisheries information leading to improved adaptive capacity and resilience of individuals and communities Improved food security for fishers and communities Increased economic performance leading to stronger, more diversified incomes

2. Total population of target provinces (adjacent to WPP 572)

Category	Province		
	Aceh	North Sumatra	West Sumatra
Province Size	56,839.09 km ²	72,981.23 km ²	42,119.54 km ²
Total Population Size	5,407,855	14,936,148	5,640,629
Population Density	92 people/km ²	205 people/km ²	133.92 people/km ²
Regencies/Cities in WPP 572	West Aceh Regency, Southwest Aceh Regency, Aceh Besar Regency, Aceh Jaya Regency, South Aceh Regency, Aceh Singkil Regency, Nagan Raya Regency, Simeulue Regency, Banda Aceh City	West Nias Regency, North Nias Regency, Gunung Sitoli City, Sibolga City, Central Tapanuli Regency, South Tapanuli Regency, Mandailing Natal Regency	Agam Regency, Mentawai Islands Regency, Padang Pariaman Regency, Pasaman Barat Regency, South Coast Regency, Padang City
Spatial Distribution	Low Elevation Coastal Zones	Low Elevation Coastal Zones	Coastal Areas, Low Elevation Zones
Household Size and Composition			
Number of households	3.49 million		
Average of household size	4.2 individuals		
Category	Province		
	Bengkulu	Lampung	Banten
Province Size	20,130.21 km ²	33,575.41 km ²	9,352,767 km ²
Total Population Size	2,060,000	9,176,546	12,251,985
Population Density	102.34 people/km ²	273 people/km ²	1310 people/km ²
Regencies/Cities in WPP 572	South Bengkulu Regency, Central Bengkulu Regency, North Bengkulu Regency, Kaur Regency, Mukomuko Regency, Seluma Regency, Bengkulu City	South Lampung Regency, East Lampung Regency, Pesawaran Regency, West Coast Regency, Tanggamus Regency, Tulang Bawang Regency, Bandar Lampung City	Serang City, Pandeglang Regency
Spatial Distribution	Coastal Areas, Low Elevation Zones	Coastal Areas, Low Elevation Zones	Coastal Areas, Low Elevation Zones
Household Size and Composition			
Number of households	518,000		
Average of household size	3.97 individuals		

Source: Statistic Indonesia (BPS)

Note that based on the table above, a conservative, rounded assumption of 4 members per household is used throughout this document when the calculation of beneficiaries assumes a multiplier effect by the household size.

3. Direct Beneficiaries Calculation:

All targets listed below have a distribution of 50% men and 50% women, please see Excel file **Annex 24a** for sex-disaggregated beneficiary calculations. Both the direct beneficiaries of each sub-activity, and the unique beneficiaries (total number of individuals, avoiding double counting impacts) are presented below.

Component 1 – Strengthen Enabling Conditions

Output 1.1: Development and deployment of evidence-based regulatory frameworks and knowledge products for ecosystem protection, fisheries sustainability, and innovative financing

Activity	Means of Verification	Calculation	Direct Beneficiaries
Activity 1.1.3. Establish knowledge management and learning center for scaling and replication	- Participant registration lists and visitor logs - Knowledge management system user records and website/platform analytics/download logs - Event and dissemination reports documenting participants	The beneficiary target for this activity contributes to ARA1, most vulnerable people and communities, specifically to Supplementary 2.5: Beneficiaries (female/male) adopting innovations that strengthen climate change resilience. Beneficiaries are estimated through two channels: 1) visitors to the Knowledge Learning Center (KLC) located at the local university in WPP 572, and 2) access to the online Knowledge Management Information System (KMIS). Adaptation requires access to timely information, proven practices, and the capacity to act on them. However, persistent knowledge and capacity gaps often limit the adoption of effective climate resilience measures by coastal communities and marine resource users. The KLC and KMIS address these barriers by providing practical, evidence-based knowledge on climate-resilient blue economy practices, sustainable fisheries and aquaculture, ecosystem-based adaptation, and marine conservation approaches that support resilient livelihoods. Access to this information enables users to adopt innovations and improved practices that reduce climate-related risks to food production, livelihoods, and natural resources. By strengthening adaptive capacity, enhancing food security, and improving resilience to climate shocks and environmental change, KLC visitors and KMIS users who apply these innovations are counted as beneficiaries under ARA1 Supplementary 2.5. Approach:	114,240 (ARA 1 Suppl. 2.5)

Activity	Means of Verification	Calculation	Direct Beneficiaries
		- For the KLC, beneficiaries are estimated based on projected visitors about 20 visitors/day over the project period from Year 2 to Year 5 (total 4 years), since the KLC is projected to be established in Year 2. An overlap rate of 15% is applied to account for repeated visitors. - For the online KMIS, beneficiaries are estimated based on projected daily downloads and user access of about 10 users/day over the project period of 4 years (the KMIS is projected to be established in Year 2 of the project). An overlap rate of 15% is applied to account for repeated users. - Total distinct beneficiaries are multiplied by an average household size of four to estimate the broader number of direct beneficiaries potentially reached. Calculation: - KLC = 20 visitors per day x 280 days per year x 4 years x (1 – 15% repeated visitors) = 19,040 - KMIS = 10 users per day x 280 days per year x 4 years x (1 – 15% repeated users) = 9,520 Total direct beneficiaries = 19,040 KLC visitors + 9,520 online users = 28,560. This number is multiplied by 4 household members = 114,240 Direct Benefit: Rising Sea Surface Temperature (SST) leading to declining fish stocks and habitat degradation, while SST and Sea Level Rise (SLR) also leading to reduced and unstable fisheries-based incomes of coastal communities. The Knowledge Learning Center (KLC) will provide the information and tools necessary to improve knowledge and increase capacity of climate risks and adaptive solutions that allow beneficiaries to adopt climate adaptive practices and innovations to build resilience. Adaptation requires timely information, proven strategies, and learning capacity, yet persistent data gaps hinder responses from local to national levels. Visitors to the KLC (both online and in person) will receive information on the blue economy, protection / production models of marine conservation, success stories and lessons learned, as well as practical information on how to improve fisheries and aquaculture techniques. These individuals will apply this information in their own lives to adopt innovations that increase food security and/or more resilient livelihoods, leading to improved overall climate resilience.	

Component 2 – Locally Led Climate Action + Investment Readiness

Output 2.1: *Locally-led climate adaptation projects are effectively implemented and monitored, resulting in enhanced climate resilience of vulnerable communities*

Activity and Sub Activity	Means of Verification	Calculation	Direct Beneficiaries
Activity 2.1.1 Sub-Activity 2.1.1.1. Manage grants for ecotourism enterprises for community development	M&E reporting from grantees	The beneficiary target for this activity contributes to ARA1, most vulnerable people and communities, specifically to Supplementary 2.1: Beneficiaries (female/male) adopting improved and/or new climate-resilient livelihood options resulting from increased economic activity in the ecotourism sector. Beneficiaries are defined as individuals who directly participate in and benefit from BEAM-supported ecotourism enterprises through employment, income-generating activities, business development support, skills development, or other livelihood opportunities created through grant-funded interventions. For the economic activity in the ecotourism sector (Supplementary 2.1), the calculation is based on the total of 9 grants that will be disbursed (5 small grants of US\$ 40,000 and 4 large grants of US\$ 400,000) targeting eco-tourism industries which include operators, logistics, transportation, and accommodation. Approach: - We assume the participation of at least 50 and 500 people from each of the targeted grantees for small and large grants, respectively, in eco-tourism development.¹ - Each household represents 4 individuals (conservatively based on demographic data presented above. This assumption applies across adaptation beneficiary calculations in this document). Calculation - Small grants = 5 grants x 50 people x 4 household members = 1,000 - Large grants = 4 grants x 500 people x 4 household members = 8,000 Total = 9,000 individuals with improved and/or diversified livelihoods - Please note that no more than 30% of these ecotourism grants will be deployed in MPA areas targeted under Sub-Activity 2.1.1.2 (where the full population is included as direct beneficiaries) – therefore to avoid double counting, the adjusted number of direct beneficiaries is 9,000 x 70% = 6,300 Direct adaptation benefit (ARA1 2.1): In WPP 572, rising Sea Surface Temperature (SST), Sea Level Rise (SLR), and extreme precipitation are shifting fish stocks, degrading	9,000 (ARA1 Suppl. 2.1) Adjusted for double counting: 6,300

¹ The assumption for the target number was based on similar TFCCA (Tropical Forest and Coral Reef Conservation Act) projects managed by KI

Activity and Sub Activity	Means of Verification	Calculation	Direct Beneficiaries
		mangroves, seagrass, and reefs, and worsening sedimentation, runoff, and flooding, reducing local communities' incomes, and heightening their vulnerability. Diversification into climate-resilient sectors is thus critical to reduce dependence and build adaptive capacity. Beneficiaries will gain access to new or improved livelihood opportunities in the ecotourism sector, including tour operators, hospitality services, logistics, and transportation. Through grant support, community members will receive capacity building on ecotourism management, sustainable tourism practices, and business development. These diversified livelihood options reduce dependence on climate-sensitive fisheries, increase household income resilience, and provide alternative economic activities that can help individuals and communities withstand climate and environmental shocks. The development of ecotourism also creates incentives for ecosystem conservation, as healthy mangroves, coral reefs, and seagrass beds are essential assets for tourism.	
Activity 2.1.1 Sub-Activity 2.1.1.2 Manage grants for collaborative MPA management	M&E reporting from grantees	The beneficiaries under this Sub-activity contribute to ARA1 Supplementary 2.1: Beneficiaries (female/male) adopting improved and/or new climate-resilient livelihood options; and ARA2 Supplementary 2.2: Beneficiaries (female/male) with improved health, well-being, food and water security. The beneficiary target for this activity consists of individuals engaged in MPA community management (for ARA1) and individuals in fishing and mariculture (for ARA2) within the targeted MPAs. Strengthening MPA management (through better enforcement, community co-management, etc.) leads to measurable ecological gains (e.g. more fish and healthier reefs)^{2,3} and socioeconomic improvements (e.g. greater fish consumption, diverse diets, and higher fisheries income)^{4,5}. Number of grants: 7 small grants (@ \$40,000) and 4 large grants (@ \$400,000) (Total 11 grants). No direct beneficiaries are included here for individuals in tourism industries in MPA adjacent areas, as the beneficiaries have been included within the intervention in the Sub-Activity 2.1.1.1 (ecotourism development). Approach: For community MPA management an estimated 20 people per MPA will actively carry out surveillance. The target group for fishers in each MPA is set at 500 people, while for mariculture is set at 200 people with four household members each.⁶	33,440 (ARA 1 Sup 2.1) 84,040 (ARA 2 Sup 2.2)

² Gill et al., 2024 (<https://doi.org/10.1073/pnas.2313205121>)

³ Campbell et al., 2019 (<https://doi.org/10.1111/conl.12698>)

⁴ Darling, 2014 (<https://doi.org/10.1371/journal.pone.0113614>)

⁵ Westlund et al., 2017 (<https://www.proquest.com/openview/af5d2e4aaa4925eab94af4710b5f9af7/1?pq-origsite=gscholar&cbl=237320>)

⁶ The assumption for the target number was based on similar past projects managed by YKAN and KI.

Activity and Sub Activity	Means of Verification	Calculation	Direct Beneficiaries
		Calculation for ARA 1 (improved livelihoods for community surveillance groups) - 11 MPAs x 3 community surveillance group x 20 individuals x 4 household members = 2,640 - Direct adaptation Benefit: These beneficiaries and their families will receive additional income to undertake MPA surveillance / enforcement of MPA regulations. Additional / diversified income is shown to increase multivariate resilience of vulnerable individuals, allowing them to recover more effectively from climate impacts. This improved income will be sustained through MPA management units / flow of funds from activities under Component 1 (innovative financial mechanisms for ongoing MPA management funding) Calculation for ARA1 (improved livelihoods for fishers operating in MPAs) - (11 MPAs x 500 fishers x 4 household members) + (11 MPAs x 200 mariculture farmers x 4 household members) = 22,000+8,800 = 30,800 - All of these fishers and mariculture workers come from the coastal villages adjacent to MPAs, see ARA 2 food security below for avoidance of double counting calculation. - Number of fishers and mariculture farmers benefitted by a grant is averaged across the sizes of grant to be issued / population adjacent to each MPA. - While these beneficiaries will also experience food security benefits, they are included under improved livelihoods as this is the primary climate benefit for this population. Direct adaptation benefit: - Fisheries productivity is negatively affected by increased SLR, SST, and ecosystem degradation from pollution and runoff due to increased extreme storm events. These beneficiaries and their families will receive additional income from higher fish catches / mariculture yields resulting from improved MPA management and resulting fisheries productivity⁷. Calculation for ARA2 (improved food security) - 11 MPAs receiving Component 2 grant support x (12) coastal villages adjacent to MPAs (on average) x 1000 individuals = 132,000 x 87% = 114,840 (-30,800 counted above under improved livelihoods) = 84,040. - Approximately 87% of the population in these villages regularly consume fish⁸ - ~11 MPAs will receive support (of 19 possible under management by KKP in the 6 provinces). The number of MPAs receiving grant support may be modified during implementation to ensure that the total number of villages / target beneficiary population target is achieved through this sub-grant window. - Data collection will take place by fishers (grantees) at fish landing sites to verify additional fisheries production over the course of Project implementation.	

⁷ Campbell et al., 2019 (<https://doi.org/10.1111/conl.12698>)

⁸ Please see https://www.myfoodresearch.com/uploads/8/4/8/5/84855864/1_fr-ictcred-005_soselisa.pdf, 87% is calculated from the average percentage of people in coastal villages in Maluku eating seafood for lunch and dinner.

Activity and Sub Activity	Means of Verification	Calculation	Direct Beneficiaries
		Direct adaptation benefit: These beneficiaries will have higher food security resulting from greater productivity of MPA areas / higher fish and mariculture product availability and potentially lower cost for these products. See footnote 7 for evidence for the improved productivity of fisheries when MPA management is improved in Indonesia. -	
Activity 2.1.1 Sub-Activity 2.1.1.3 Manage grants for sustainable and diversified fishing livelihoods (community-based economic activities)	Reporting from grantees and fish catch records undertaken by grantees as part of their M&E grant reporting requirements	The beneficiary target for this Sub-Activity contributes to ARA1, most vulnerable people and communities, Supplementary 2.1: Beneficiaries (female/male) adopting improved and/or new climate-resilient livelihood options. The calculation is based on the total of 8 grants that will be disbursed (5 small grants of US\$ 40,000 and 3 large grants of US\$ 400,000) targeting community groups to support sustainable and diversified fishing livelihoods. Based on the grant size, number of community groups that will get benefit from small grants and large grants are 15 and 60 community groups, respectively. Each community group consists of roughly 20 households⁹, with each household representing four individuals. Calculation - Small grants = 5 grants x 15 community groups x 20 households x 4 individuals = 6,000 - Large grants = 3 grants x 60 community groups x 20 households x 4 individuals = 14,400 Total = 20,400 individuals with improved / diversified livelihoods - These individuals will have higher incomes and/or improved food security (BEAM assumes equal distribution between these results areas) resulting from grants to improve sustainable fishing practices. - No more than 30% of these grants will be deployed in MPA areas targeted under 2.1.1.2. To avoid double counting, the total number of beneficiaries under this Sub-Activity are therefore reduced by 30%. 20,400 x 70% = 14,280 - While these beneficiaries will also experience food security benefits, they are included under improved livelihoods as this is the primary climate benefit for this population. Direct adaptation benefit: Rising SST, SLR, and extreme precipitation are shifting fish distributions, degrading mangroves and seagrass, and worsening sedimentation, runoff, and flooding, reducing fish stocks, increasing catch variability, and threatening livelihoods and food security. Fishers face declining catch rates, rising resource competition, and weather vulnerability, compounded by poverty, few alternatives, and poor access to finance and technology. Beneficiaries will gain access to improved and diversified livelihood options through grants that support sustainable fishing practices, including better fishing gear, post-harvest handling equipment, and training on sustainable capture techniques. The grants enable community	20,400 (ARA1 Sup 2.1) Adjusted for double counting: 14,280

⁹ The typical number of community groups is around 20. This aligns well with the average size of village cooperatives, which typically range from 10 to 30 members.

Activity and Sub Activity	Means of Verification	Calculation	Direct Beneficiaries
		groups to adopt climate-resilient livelihood strategies that reduce pressure on marine resources, increase fishing efficiency, and diversify income sources. By supporting sustainable fishing practices and community-based economic activities, these interventions help fishers adapt to declining fish stocks and changing ocean conditions resulting from climate change. Diversified livelihood options, including improved fishing techniques, value-added processing, and alternative income-generating activities, reduce dependence on a single livelihood source, increase household income resilience, and provide a buffer against climate and environmental shocks.	
Activity 2.1.1 Sub-Activity 2.1.1.4 Manage grants for sustainable waste management	M&E reports from grantees assessing effectiveness of waste reduction initiatives and monitoring of improvements in food / water security resulting from reduced pollution in target communities.	The number of individuals benefiting from improved waste management practices: ARA2 Supplemental 2.2. Health, well-being, food and water security. The beneficiary target for this activity is determined by the total population residing in the areas that will be positively impacted by approved waste management interventions funded by the Grant Facility, resulting in lower pollution rates. The calculation is based on a total of 8 grants that will be disbursed (5 small grants of US\$ 40,000 and 3 large grants of US\$ 400,000). Based on the grant size, the improved waste management practices funded will cover 2 villages (small grants) and 25 villages (large grants). Each village population averages 1,000 people (range is 500-3000, 1000 is taken as a conservative estimate). The population figures are roughly equivalent when a larger population centre is targeted under this intervention (e.g fewer villages, but includes a larger town). Calculation - Small grants: 5 grants x 2 villages x 1,000 population = 10,000 - Large grants: 3 grants x 25 villages x 1,000 population = 75,000 Total = 85,000 individuals with improved health, well-being, food and water security. - No more than 40% of these beneficiaries targeted for improved waste management will be located MPA areas targeted under 2.1.1.2. To avoid double counting, the total number of beneficiaries under this Sub-Activity are therefore reduced by 40%. $85,000 \times 60\% = \mathbf{51,000}$ - These individuals will have improved well-being due to reduced pollution levels. Coastal wastewater pollution endangers health through contaminated seafood, particularly in fishing-dependent communities, making pollution control vital for food safety and public health¹⁰. Plastic waste pollution can reduce the quality of the environment, undermining both sanitation and scenic beauty¹¹. Improving waste management, including solid waste, plastics, and wastewater treatment, can yield major benefits for human well-being¹², including reductions in disease and health risks¹³.	85,000 (ARA 2 Suppl. 2.2) Adjusted for double counting: 51,000

¹⁰ <https://oursharedseas.com/how-wastewater-affects-nearshore-fisheries/#:~:text=,combination%20with%20other%20efforts%20to>

¹¹ Ardiansyah et al., 2022 (<https://doi.org/10.1007/s11852-022-00888-x>)

¹² Abubakar et al., 2022 (<https://doi.org/10.3390/ijerph191912717>)

¹³ McClelland et al., 2022 (<https://doi.org/10.3390/ijerph19074218>)

Activity and Sub Activity	Means of Verification	Calculation	Direct Beneficiaries
		- Reduced pollution levels are also expected to improve ecosystem services, including increased fisheries productivity, but this impact is not directly calculated under this intervention / adaptation beneficiary total. Direct adaptation benefit: Climate change worsens waste management in WPP 572: extreme precipitation overwhelms infrastructure, washing untreated waste into coastal waters; SLR and erosion flood disposal sites, spread contaminants, and degrade mangrove filtration; rising SST accelerates bacterial growth, threatening community health, food security, and well-being. Beneficiaries will experience improved health, well-being, food and water security resulting from reduced pollution levels in their communities. Coastal wastewater pollution endangers health through contaminated seafood, particularly in fishing-dependent communities, making pollution control vital for food safety and public health. Plastic waste pollution reduces environmental quality, undermining both sanitation and scenic beauty. Improving waste management, including solid waste, plastics, and wastewater treatment, yields major benefits for human well-being, including reductions in disease and health risks, improved water quality, and safer food sources. These interventions also help communities adapt to climate change by reducing pollution and sedimentation of coastal ecosystems, which are further exacerbated by increased storm activity and flooding. Reduced pollution levels are also expected to improve ecosystem services, including increased fisheries productivity, contributing to long-term food security and livelihood resilience.	

Output 2.2: *Blue carbon and renewable energy projects are effectively implemented and monitored, resulting in reduced GHG emissions*

Activity and Sub Activity	Means of Verification	Calculation	Beneficiary
Activity 2.2.1 Sub-Activity 2.2.1.1 Manage grants for high carbon ecosystem restoration	M&E reports from grantees	These grants will provide direct benefit to coastal households located near restored or rehabilitated mangrove ecosystems which will provide a suite of benefits, but this calculation focuses on the benefits under ARA 2, Improved health, well-being, food and water security. Since improved food security is usually the most significant of the benefits from mangroves and is always an important mangrove benefit (as opposed to benefits from flood protection and tourism which are more site dependent), the beneficiaries will be captured under ARA2 Supplementary 2.2: Beneficiaries (female/male) with improved food security. Mangroves are well known for providing a wide variety of ecosystem services that underpin the food security, health and well-being of coastal populations. Examples of well-documented ecosystem services include improved fisheries productivity (both within mangrove areas and because	49,000 (ARA2 Sup 2.2) Adjusted for double counting: 34,300

Activity and Sub Activity	Means of Verification	Calculation	Beneficiary
		mangroves act as nursery areas for marine species)¹⁴, flood protection and erosion control from coastal storm surge events^{15,16}, nutrient cycling, wood and biomass energy sources, non-timber forest products (e.g. medicinal plants, fodder, honey), climate regulation, pollution abatement, protection from sedimentation, protection from salt intrusion and recreational value (e.g. mangrove-based ecotourism). Large scale reviews of the value of these ecosystem services demonstrate the important economic contribution made by mangroves, especially to those living closest to them.^{17,18} For example, a mangrove restoration project in Central Java, Indonesia, increased fish production and fishers' income, with 86% of fishers reporting better catches¹⁹. Global estimates of the ecosystem service value of one hectare of mangroves average US\$21,100 per hectare per year (in 2018 prices) according to a recent review of 250 attempts at valuing the ecosystem services of mangroves, highlighting the importance of mangrove habitat to local people²⁰. A recent cost benefit analysis of mangrove conservation and restoration interventions in Indonesia estimated average values for a subset of the most studied ecosystem services to be \$8,800/ha/year (excluding blue carbon value which is mostly a national/global benefit rather than a local one) but highlighted that mangrove value varies depending on location and the ecosystem service considered²¹. For example, flood protection benefits alone can reach up to \$100,000 per year in Indonesia in high density, high value land value areas. For the purposes of estimating the target beneficiaries from mangrove restoration, the number of villages where restoration will take place is presented below. The beneficiary target comprises coastal households residing in communities (with estimation 1000 individuals per village) adjacent to restored mangrove ecosystems that rely on mangrove-supported ecosystem services for food security, fisheries production, coastal protection, and livelihood resilience. Seagrass restoration is also expected to provide a suite of adaptation benefits in the form of ecosystem service benefits, but due to the small number of hectares to be restored (6ha), that calculation is omitted here. The ecosystem services of seagrass are also less well documented and harder to tie to specific beneficiaries. Beneficiaries:	

¹⁴ Mangroves support an estimated annual abundance of over 700 billion juvenile fish and invertebrates (zu Ermgassen et al., 2025; <https://doi.org/10.1038/s43247-025-02229-w>)

¹⁵ McIvor et al., 2012. Storm surge reduction by mangroves. NCP Report 2012-02. <https://www.nacionmulticultural.unam.mx/mezinal/docs/3151.pdf>

¹⁶ Menendez et al. 2020. The Global Flood Protection Benefits of Mangroves. Scientific Reports 10:4404 <https://www.nature.com/articles/s41598-020-61136-6>

¹⁷ Mukherjee et al. 2014. Ecosystem Service Valuations of Mangrove Ecosystems to Inform Decision Making and Future Valuation Exercises. PLoS ONE 9(9): e107706. doi:10.1371/journal.pone.0107706

¹⁸ Hutchinson et al. 2014 The Role of Mangroves in Fisheries Enhancement. The Nature Conservancy and Wetlands International. 54 pages

¹⁹ In Timbulsloko, Central Java, restoring 8.5% of mangrove cover created new fisheries. Restored area yielded \$1.05/hour profit from previously non-existent fisheries, proving rapid ecological recovery. (Debrot et al., 2022; <https://doi.org/10.1016/j.ecss.2022.107761>)

²⁰ Getzner, M. and Islam, M.H. 2020 Ecosystem Services of Mangrove Forests: Results of a Meta-Analysis of Economic Values. Int. J. Environ. Res. Public Health doi: [10.3390/ijerph17165830](https://doi.org/10.3390/ijerph17165830)

²¹ The World Bank 2021. The Economics of Large-scale Mangrove Conservation and Restoration in Indonesia. <https://openknowledge.worldbank.org/bitstream/handle/10986/37605/P17181101f1de101e0b9b3045bbb64b2124.pdf>

Activity and Sub Activity	Means of Verification	Calculation	Beneficiary
		Number of mangrove restoration grants: 4 large grants (@ \$400,000) and 9 small grants (@ \$40,000). - Across Small grants: 67 ha for 9 grants: 9 villages x 1000 people = 9,000 - Across Large grants: 218 ha for 4 grants: 40 villages x 1000 people = 40,000 - Total area of mangrove restoration = 285 ha Total number of beneficiaries = 49,000 - No more than 30% of these beneficiaries targeted for improved ecosystem services from mangrove restoration will be located MPA areas targeted under 2.1.1.2. To avoid double counting, the total number of beneficiaries under this Sub-Activity is therefore reduced by 30%. 49,000 x 70% = 34,300 Direct adaptation benefit (ARA2 2.2): Climate change accelerates mangrove loss via SST stress, SLR-induced retreat and erosion, extreme precipitation driving sedimentation and pollution, and ocean acidification. Degrading these fish nursery habitats, coastal defenses, and pollution filters undermines food security, livelihoods, and resilience. Without restoration, fisheries will decline, coastal vulnerability will rise, and food insecurity will worsen. Beneficiaries residing in villages adjacent to restored mangrove areas will experience improved food security through enhanced fisheries productivity. Mangroves serve as critical nursery habitats for commercially important fish species, supporting both capture fisheries and mariculture. Restored mangrove ecosystems also provide coastal protection against storm surges and erosion, reducing vulnerability to climate-related disasters. Additional benefits include improved water quality, availability of non-timber forest products, and enhanced livelihood opportunities through sustainable mangrove-based activities (e.g., ecotourism, beekeeping, and crab farming). These ecosystem services contribute to diversified diets, increased household income, and reduced food insecurity among coastal communities.	
Activity 2.2.1 Sub-Activity 2.2.1.2 Manage grants for small-scale renewable energy deployment/ installation	M&E reports from grantee Projects	Beneficiary target for this activity will contribute towards ARA1, supplementary indicator 2.5. Beneficiaries (female/male) adopting innovations that strengthen climate change resilience. The target beneficiaries are the boat owners with vessels below 10GT. There are ~911 fishing vessels below 10GT registered in WPP 572.²² Approach: the estimated cost of a solar chiller system is US\$5,000, The total grant allocation is US\$1,560,000. 20% of the grant (~US\$ 310,000) will be used for operational costs, the remaining US\$ 1.25 million will be direct procurement of equipment. For nano and small fishing vessels, approximately 5-15 crew members are employed (assuming 10 on average). Each crew consists of 4 households.	10,000 (ARA1 Suppl. 2.5) Adjusted for double counting: 7,000

²² The data derived from MMAF's website database per July 2021. Source: <https://perizinan.kkp.go.id/chart.php?doc=10>

Activity and Sub Activity	Means of Verification	Calculation	Beneficiary
		Number of grants to be issued: 9 small grants (@ \$40,000) and 3 large grants (@ \$400,000) (Total 12 grants) Calculation: (250 solar chiller systems) x 10 crew members (average) x 4 household members = 10,000 individuals with improved livelihoods²³ - With the provision of renewable energy chiller technology, these individuals will be able to preserve more of their catch, resulting in higher sales and increased incomes. Grantees will report on baseline and post-intervention incomes. - No more than 30% of the crew members are estimated to live in MPA areas targeted under 2.1.1.2, so to avoid double counting, the number of beneficiaries under this Sub Activity is adjusted: 10,000 x 70% = 7,000 Direct adaptation benefit: In WPP 572, climate change hits small-scale fisheries in a variety of ways - rising SST shifts fish stocks, forcing longer trips; extreme weather cuts fishing days and raises safety risks; SLR and erosion damage landing sites. Post-harvest losses worsen with longer trips and poor cold chains. Lower catches, higher costs, and losses undermine incomes, food security, and resilience. Beneficiaries, primarily crew members of small-scale fishing vessels, will adopt innovative renewable energy technology (solar-powered chillers) that strengthens climate resilience. With the provision of solar chiller technology, fishers can preserve more of their catch at sea, significantly reducing post-harvest losses and spoilage. This results in higher quality fish products, increased sales value, and improved household incomes. The technology also reduces dependence on expensive and environmentally harmful ice production, lowering operational costs and carbon emissions. Grantees will report on baseline and post-intervention incomes to track livelihood improvements. By reducing fish waste and increasing the value of catches, this intervention enhances food security, strengthens economic resilience, and supports sustainable fishing practices that reduce pressure on marine resources.	

Output 2.3: Blue economy enterprises have improved access to finance and expand operations in WPP 572

Activity	Means of Verification	Calculation	Beneficiary
Activity 2.3.1. Sub-Activity 2.3.1.1. Provide technical assistance to BLU LPMUKP	• BLU LPMUKP quarterly operational reports • IT loan management system data • Independent verification of new borrowers	The target result area for this activity relates to ARA1 Supplementary 2.1 Improved climate-resilient livelihoods. Based on BLU LPMUKP data for the six WPP 572 provinces (Aceh, West Sumatra, North Sumatra, Bengkulu, Lampung, Banten), there are a total of 436 active BLU loans. BEAM will provide technical assistance to BLU LPMUKP to: 1) digitize the loan management system, reducing processing time from weeks to days; 2) simplify application procedures,	16,000 (ARA 1 Suppl. 2.1) Adjusted for double counting: 11,200

²³ The assumption for the target number was based on similar TFCCA (Tropical Forest and Coral Reef Conservation Act) projects managed by KI

Activity	Means of Verification	Calculation	Beneficiary
	(disaggregated by gender, sector, location) Participant registration lists and institutional participant databases	lowering barriers for small-scale fishers and fish farmers; and 3) train extension officers to reach remote coastal villages. It is estimated that a ~50% increase in active loans is achievable within the BEAM project period of performance. BEAM targets an additional 200 loans to be issued by BLU LPMUKP over the Project period. BEAM's intervention addresses the supply-side barrier to access to finance – the complex, paper-heavy processes that prevent enterprises from even entering BLU LPMUKP's formal credit pipeline. New loans issued to local marine sector enterprises represent improved access to finance and therefore improved and diversified livelihoods for enterprise staff and their households. Calculation: - Access to finance target: 200 additional (over baseline) loans issued by BLU LPMUKP to MSMEs in WPP 572 - Average members per community enterprise is approximately 20 employees²⁴, with each household consisting of an average of four individuals. - 200 loans to community enterprises x 20 individuals per enterprise x 4 household members = 16,000 - No more than 30% of individuals targeted under this Activity will reside in MPA areas. To avoid double counting: 16,000 x 70% = 11,200 - Total: 11,200 Direct adaptation benefit (ARA1 2.1): In WPP 572, climate change pressures marine and fisheries enterprises: rising SST shifts fish stocks, lengthening trips, raising costs, and cutting profits; extreme weather reduces fishing days, damages gear, and disrupts supply; SLR and erosion degrade infrastructure. These climate pressures are compounded by limited access to affordable credit, which prevents enterprises from investing in climate-resilient equipment, diversifying their operations, adopting sustainable practices, and building financial buffers against climate shocks. Without access to finance, small-scale fishers and fish farmers remain trapped in a cycle of poverty and vulnerability, unable to adapt to the accelerating impacts of climate change. Beneficiaries will gain improved and diversified livelihood options through increased access to affordable credit. New loans issued to marine sector enterprises enable business expansion, equipment purchases, working capital investment, and adoption of climate-resilient practices. The digitization of BLU LPMUKP's loan management system reduces processing time, while simplified application procedures lower barriers for small-scale fishers and fish farmers. Trained extension officers will reach remote coastal villages, ensuring that previously excluded communities can access formal financial services.	

²⁴ Our initial discussions revealed that the typical number of community groups is around 20. This aligns well with the average size of village cooperatives, which typically range from 10 to 30 members.

Activity	Means of Verification	Calculation	Beneficiary
		These improved livelihood outcomes, including increased income, business growth, and employment generation, reduce vulnerability to climate shocks and strengthen household resilience.	

4. Indirect Beneficiaries

The calculation for indirect beneficiaries is derived from the number of people benefiting from the implementation and operationalization of BEAM-supported enabling mechanisms. To distinguish between the geographic footprint of BEAM implementation and the longer-term transformational impact of the enabling mechanisms supported through the project, indirect beneficiaries are estimated at two scales. The first represents the population within the six BEAM implementation provinces (Aceh, North Sumatra, West Sumatra, Bengkulu, Lampung, and Banten), where project activities under Components 1 and 2 are directly implemented. This estimate reflects the population expected to benefit indirectly from the combined implementation of BEAM interventions within the six project provinces during the project implementation period and early operationalisation phase. Under Component 1, BEAM will strengthen enabling conditions for climate-resilient marine and coastal management through development of regulatory frameworks, establishment and expansion of MPAs, strengthening of MPA management effectiveness, innovative financing and PPP mechanisms, and knowledge-sharing systems that support scaling and replication. Under Component 2, BEAM will support locally led adaptation investments through grants for collaborative MPA management, climate-resilient fisheries livelihoods, ecotourism, waste management, ecosystem restoration, renewable energy solutions, and improved access to finance through strengthened BLU LPMUKP systems. Together, these interventions are expected to improve ecosystem health, strengthen fisheries productivity, increase access to climate-resilient livelihood opportunities, improve food security, expand access to concessional finance, and enhance the resilience of coastal economies. As these interventions are implemented across the six target provinces, adaptation benefits are expected to extend beyond direct grant recipients and institutions to a broader population of marine capture fishers, mariculture producers, tourism actors, coastal MSMEs, and households that rely on healthy marine and coastal ecosystems and blue economy value chains.

The second represents the broader population across Indonesia's coastal villages that may benefit over the 20-year project lifetime through replication, scaling, and sustained operationalisation of BEAM-supported Public-Private Partnership (PPP) mechanisms, MPA financing systems, and policy reforms under **Component 1**, and BLU LPMUKP financing-system improvements under **Component 2**. The indirect beneficiary calculations therefore distinguish between: (i) beneficiaries expected within the direct implementation geography of the project during implementation and early operationalisation of supported mechanisms; and (ii) beneficiaries that may be reached through the sustained use, scaling, and replication of these mechanisms nationally over the 20-year project lifetime. This distinction reflects the dual nature of BEAM as both an implementation project in six provinces and a transformational investment designed to strengthen national systems for climate-resilient marine and coastal management and blue-economy financing.

BEAM's indirect beneficiaries are defined as people working in or relying on blue economy sectors that are expected to benefit from the implementation of BEAM-supported enabling conditions for climate-resilient marine and coastal management. These sectors include marine capture fisheries, mariculture, and marine ecotourism within Indonesia's coastal villages and who may potentially benefit from improved marine and coastal management systems and climate-responsive financing mechanisms supported through BEAM. The estimated indirect beneficiary total is not derived

from policy enactment alone. Rather, it reflects the population expected to benefit from the implementation of two mutually reinforcing BEAM-supported pathways: (i) Public-Private Partnership (PPP) mechanisms and related policy reforms for MPA and coastal management, and (ii) improved access to climate-responsive concessional finance through BLU LPMUKP system improvements. The indirect beneficiary estimate represents the potential population expected to benefit where BEAM-supported mechanisms are operationalised and used. Consistent with the transformational nature of BEAM's interventions, the indirect beneficiary estimate reflects the potential scale of people who may benefit from the implementation, replication, scaling, and sustained use of BEAM-supported policy, institutional, financing, and management mechanisms over time. This approach recognizes that enabling conditions created through Public-Private Partnership mechanisms, regulatory reforms, and financing-system improvements may generate adaptation benefits beyond the immediate project intervention period and geographic footprint where these mechanisms continue to be operationalised and applied. Furthermore, the calculation assumes that these benefits will accrue over the project lifetime (20 years – as per the GHG calculations) at the national scale rather than only during the implementation period. We assume that indirect beneficiaries during the project implementation period will mostly be within WPP572 due to the regional nature of the interventions. We provide an estimate of the expected indirect beneficiaries during the implementation period below.

Under **Component 1**, BEAM will support national and provincial governments to improve regulatory and institutional frameworks for marine and coastal ecosystems and fisheries, support provincial implementation of national strategies, and develop innovative financing mechanisms for MPA management. This includes support for the development of one new national MPA, expansion of two provincial MPAs, promotion of sustainable fisheries management, feasibility studies for blue financing, and support to MPA management units to strengthen their capacity to design and enforce effective MPA regulations. Strengthening the PPP framework is expected to improve coordination between government, private sector, and communities in managing MPAs, enabling more inclusive investment, better infrastructure for fisheries and tourism, and sustainable access to marine resources. The PPP framework will be led by the Ministry of Marine Affairs and Fisheries (MMAF) as the technical policy lead, and the provincial Marine and Fisheries Agencies (DKP – *Dinas Kelautan dan Perikanan*) as the on-the-ground implementers. The PPP framework aims to catalyse private capital into sustainable blue economy business (e.g., sustainable fisheries, mariculture, and ecotourism sectors), benefiting local communities adjacent to MPAs particularly work on the blue economy sectors. This improvement will help address key barriers to climate-resilient MPA management, including insufficient operational financing, weak coordination, limited private investment, and inadequate community participation. By enabling more predictable and inclusive investment in MPA management, sustainable fisheries, mariculture, ecotourism, and supporting infrastructure, the PPP framework is expected to improve the enabling conditions for climate-resilient blue economy livelihoods and indirectly improve food security and promote more sustainable and diversified livelihoods across the blue economy sectors.

This PPP pathway is complemented by **Component 2**, which provides technical assistance to BLU LPMUKP to address operational barriers that constrain its outreach to MSMEs. Specific deliverables include the development and deployment of a digitised loan management platform covering loan origination, disbursement, portfolio monitoring, and repayment tracking; streamlining BLU LPMUKP's loan application and approval procedures; and training at least 100 BLU LPMUKP extension officers in the new IT system and simplified, climate-responsive disbursement methods. This support is expected to improve access to affordable finance for marine and fisheries MSMEs, including marine capture fishers, aquaculture and mariculture producers, fish processing and marketing actors, salt producers, and other coastal enterprises. BLU LPMUKP's 2025 performance report²⁵ provides evidence of the types of blue economy actors reached through its financing services. In 2025, BLU LPMUKP disbursed IDR 164.927

²⁵ LPM UKP, Performance Report of BLU LPMUKP 2025 (*Laporan Kinerja BLU LPMUKP Tahun 2025*), Ministry of Marine Affairs and Fisheries, 2025. The report states that by 31 December 2025 BLU LPMUKP had realised IDR 164,927,483,420 in revolving fund financing, reaching 38 debtors including sectors related to marine capture fisheries, mariculture, and fish processing and marketing

billion, including sectors related to marine capture fisheries (47% debtors), mariculture (19% debtors), and fish processing and marketing (34% debtors).

The two pathways are treated as integrated implementation mechanisms supporting the same broad indirect beneficiary population, rather than as separate beneficiary pools to be added together. The PPP pathway improves the policy, financing, and institutional conditions for climate-resilient MPA and coastal management, while the BLU LPMUKP pathway improves the financial delivery system that enables blue economy actors to access concessional finance for sustainable and climate-resilient livelihoods. Together, these interventions are expected to improve the enabling environment for marine capture fisheries, mariculture, and marine ecotourism actors, but the same individuals and households may benefit from both pathways. The adaptation benefits expected from these implemented enabling conditions include improved food security, more resilient livelihoods, and strengthened adaptive capacity. Through the PPP-supported MPA and coastal management pathway, better-financed and more effectively managed MPAs can protect coral reefs, mangroves, and seagrass beds that support fish spawning, nursery habitats, coastal protection, and fisheries productivity. These ecosystem services are expected to contribute to improved food security and livelihood resilience for fisheries-dependent households. Through the BLU LPMUKP pathway, improved access to concessional finance can help marine and fisheries MSMEs adopt climate-resilient practices, improve production systems, reduce post-harvest losses, diversify enterprise activities, and strengthen household income resilience. Both pathways respond to climate-related risks faced by blue economy actors, including declining fisheries productivity, changing fish distribution, extreme weather, ecosystem degradation, post-harvest losses, and reduced livelihood security.

For ex-ante estimation, the intended indirect beneficiary target is **people who work in the blue economy sectors related to marine capture fisheries, mariculture, and marine ecotourism within coastal villages across Indonesia**. These beneficiaries are not assumed to receive direct household-level support from BEAM; rather, they are expected to benefit indirectly from the implementation and operationalisation of BEAM-supported enabling mechanisms, including: (i) PPP mechanisms and related policy reforms that improve financing, governance, and management of MPAs and coastal resources; and (ii) systems strengthening for BLU LPMUKP to improve access to climate-responsive concessional finance for marine and fisheries MSMEs. Together, these interventions are expected to create more sustainable access to marine resources, improved ecosystem services, greater food security, more resilient livelihoods, and enable more resilient and diversified blue economy livelihoods. Indirect beneficiaries will be reported and validated through evidence that the PPP framework and related policy reforms have been adopted, operationalized, or used by relevant government, private sector, or community actors; and BLU LPMUKP financing-system improvements have moved beyond adoption or technical assistance and have been operationalised or used by relevant government, private sector, financial, or community actors in ways that support implementation of adaptation measures and generate a plausible pathway to measurable climate resilience outcomes.

Indonesia currently has 12,968 coastal villages, or about 15.39% of total villages in Indonesia²⁶, of which 1,841 coastal villages are located within the six BEAM implementation provinces consisting of Aceh (724 villages), North Sumatra (430), West Sumatra (135), Bengkulu (183), Lampung (237), and Banten (132). These provinces represent approximately 14.2% of Indonesia's coastal villages and constitute the primary geographic footprint of BEAM implementation. Of Indonesia's coastal villages, about 53.6%, 18.9%, and 10.3% are predominantly engaged in marine capture fisheries, mariculture fisheries, and tourism, respectively. Total population in each village can be ranged from <800 to >3,200 people²⁷. Conservatively assuming an average population of each village is 1,000 people, the indirect beneficiaries are calculated at 2 scales.

²⁶ Badan Pusat Statistik (2024) Statistics Indonesia on marine and coastal natural resources. <https://www.bps.go.id/id/publication/2024/11/29/d622648a533da3bc907e8b3a/statistik-sumber-daya-laut-dan-pesisir-2024.html>

²⁷ <https://www.detik.com/edu/detikpedia/d-7069373/klasifikasi-desa-berdasarkan-perkembangan-jumlah-penduduk-dan-bentuk-lahan>

a) Indirect beneficiaries within BEAM implementation provinces

This estimate reflects the population expected to benefit indirectly from the implementation of Component 1 and Component 2 within the six project provinces during the project implementation period.

- Marine capture fisheries = 1,841 villages x 1,000 individuals x 53.6% = **986,776**
 - Mariculture fishers = 1,841 villages x 1,000 individuals x 18.9% = **347,949**
 - Marine ecotourism = 1,841 villages x 1,000 individuals x 10.3% = **189,623**
- Total = 1,524,348

To avoid double counting, this total is adjusted by subtracting the number of direct beneficiaries reached through BEAM implementation (355,800).

Total indirect beneficiaries within BEAM implementation provinces = 1,524,348 – 355,800 = 1,168,548

b) National indirect beneficiaries over the project lifetime (20 years)

The national estimate reflects the transformational scale of BEAM's enabling mechanisms. The PPP framework under Component 1 is intended to improve governance, financing, and management systems for MPAs and coastal ecosystems that can be replicated and applied beyond the initial project geography. Similarly, Component 2 support to BLU LPMUKP seeks to strengthen a national financing system that serves marine and fisheries MSMEs throughout Indonesia. As these mechanisms become operationalized, adopted, and sustained by government agencies, financial institutions, private-sector actors, and coastal communities, adaptation benefits may extend progressively across Indonesia's coastal villages over the project lifetime (20 years).

- Marine capture fishers = 12,968 villages x 1,000 individuals x 53.6% = **6,950,848**
- Mariculture fishers = 12,968 villages x 1,000 individuals x 18.9% = **2,450,952**
- Marine ecotourism = 12,968 villages x 1,000 individuals x 10.3% = **1,335,704**

Total national indirect beneficiaries over the project lifetime = 10,737,504

5. Summary

The **direct beneficiary** total for BEAM is **355,800**, of which 177,900 are men and 177,900 are women. The **indirect beneficiaries** are estimated at two scales. Within the six BEAM implementation provinces, the estimated indirect beneficiaries are **1,168,548 people** who work or rely on the blue economy sectors related to marine capture fisheries, mariculture, and marine ecotourism. At the national level, total indirect beneficiary estimate is **10,737,504 people** who work or rely on the blue economy sectors in Indonesia. A summary of these calculations is provided in the following table.

Component and Output	Activity and Sub Activity	Total Direct Beneficiary (unique)	Total Indirect Beneficiary
Component 1 – Strengthen Enabling Conditions			

Component and Output	Activity and Sub Activity	Total Direct Beneficiary (unique)	Total Indirect Beneficiary
Output 1.1. Development and deployment of evidence-based regulatory frameworks and knowledge products for ecosystem protection, fisheries sustainability, and innovative financing	<i>Activity 1.1.3. Establish knowledge management and learning center for scaling and replication</i>	114,240	1,168,548 (6 year implementation period)
Component 2 – Locally Led Climate Action + Investment Readiness			10,737,504 (lifetime)
Output 2.1: Locally-led climate adaptation projects are effectively implemented and monitored, resulting in enhanced climate resilience of vulnerable communities	<i>Activity 2.1.1 Deploy grants for sustainable climate change adaptation in coastal communities</i>	189,060	
	Sub-Activity 2.1.1.1 Manage grants for ecotourism enterprises for community development	6,300	
	Sub-Activity 2.1.1.2 Manage grants for collaborative MPA management	117,480	
	Sub-Activity 2.1.1.3. Manage grants for sustainable and diversified fishing livelihoods (community-based economic activities).	14,280	
	Sub-Activity 2.1.1.4. Manage grants for sustainable waste management.	51,000	
Output 2.2: Blue carbon and renewable energy projects are effectively implemented and monitored, resulting in reduced GHG emissions	<i>Activity 2.2.1. Deploy grants to improve ecosystems and achieve sustainable climate change mitigation impacts.</i>	41,300	
	Sub-Activity 2.2.1.1 Manage grants for high carbon ecosystem restoration	34,300	
	Sub-Activity 2.2.1.2. Manage grants for small-scale renewable energy deployment/installation.	7,000	
Output 2.3: Blue economy enterprises have improved access to finance and expand operations in WPP 572	<i>Activity 2.3.1. Improve the Investment Readiness of the Blue Economy</i>	11,200	
Total		355,800	1,168,548 (implementation period) 10,737,504 (lifetime)

6. Breakdown by Results Area: all targets have a distribution of 50% women / 50% men

ARA	IRMF detail	Target
All adaptation result areas (ARA 1, ARA 2, ARA 4)	<u>Core 2: Direct and indirect beneficiaries reached</u>	Direct: 355,800
<u>ARA1 Most vulnerable people and communities</u>	<u>Core 2: Direct and indirect beneficiaries reached</u> <u>Supplementary 2.1: Beneficiaries (female/male) adopting improved and/or new climate-resilient livelihood options</u>	Direct: 65,220
<u>ARA1 Most vulnerable people and communities</u>	<u>Core 2: Direct and indirect beneficiaries reached</u> <u>Supplementary 2.5: Beneficiaries (female/male) adopting innovations that strengthen climate change resilience</u>	Direct: 121,240
<u>ARA2 Health, well-being, food and water security</u>	<u>Core 2: Direct and indirect beneficiaries reached</u> <u>Supplementary 2.2: Beneficiaries (female/male) with improved food security</u>	Direct: 169,340