A Contribution From the American-Indonesian Scholarship Program Alumni Association to Indonesia: The 'Local Heroes for Forest Protection' Initiative in Southeast Sulawesi, West Papua, and East Nusa Tenggara

Hermudananto^{1,2}*, Alfian², Fitri Lapau², Kadek Ridoi Rahayu², Kuntari Sri Sukoyo², Miranti Triana Zulkifli², Patih Rajahasta², Riana Murianty², Rudi Hermawan², Silvia Anastasia Landa²

¹Department of Forest Management, Faculty of Forestry, Universitas Gadjah Mada, Yogyakarta, Indonesia ²American-Indonesian Scholarship Program Alumni Association (ALPHA-I), South Jakarta, Indonesia

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Alumni engagement Climate change mitigation Community service Conservation Innovation Sustainability Abstract To minimize forestry sector greenhouse gas emissions by 2030, Indonesia needs stakeholder participation, especially youth. The American-Indonesian Scholarship Program Alumni Association (ALPHA-I) initiated the "Local Heroes for Forest Protection" program to include local adolescents in climate action. During 2023-2024, 149 direct participants from three provinces (Sulawesi Tenggara, Papua Barat, and Nusa Tenggara Timur) contributed to the conservation of approximately 12.5 hectares of forest, surpassing our target area, by planting indigenous trees and indirectly impacting around 4,500 individuals through both online and on-site campaigns. The program encompassed capacity-building training, sustainability seminars, field activities, and displays via a talk-show festival on climate change, which garnered favorable comments. Despite the SWOT analysis indicating that all three regions have analogous obstacles and opportunities in program implementation, they effectively formulated action plans for forthcoming activities. Our program is anticipated to persist for three years, broadening its effects to more regions while fostering partnerships with various local and national organizations.

1. INTRODUCTION

Forests are vital for climate stabilization, regulating ecosystems, protecting biodiversity, and supporting the carbon cycle (Canadell & Raupach, 2008; International Union for Conservation of Nature, 2021; Psistaki et al., 2024). Reducing forest loss and degradation while promoting restoration could contribute to one-third of climate change mitigation by 2030 (International Union for Conservation of Nature, 2021). Indonesia's forests, the third largest tropical forests globally, store at least 70 billion tons of carbon, making them key to climate change mitigation (Adnan, 2023; Canopy, 2024).

Indonesia's First Nationally Determined Contribution (NDC) targets a 29% unconditional and up to 41%

conditional reduction in greenhouse gas emissions by 2030, compared to business as usual (Republic of Indonesia, 2022). A significant portion of this reduction (around 497 MtCO2e) comes from forestry. Indonesia also aims to peak national GHG emissions by 2030, with the forest and land-use sector serving as a net sink to support global climate efforts (Ministry of Environment and Forestry, 2023).

Local communities, particularly youth, are crucial in reducing deforestation and combating climate change (Haynes & Tanner, 2015). With over 60 million Indonesians aged 16-30, raising awareness among this demographic is essential (Badan Pusat Statistik, 2022). Young people can spread climate knowledge within their communities,

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^{*}Corresponding author: Hermudananto

Department of Forest Management, Faculty of Forestry, Universitas Gadjah Mada, Jl. Agro No. 1 Bulaksumur Yogyakarta 55281, Indonesia Email: hermudananto@ugm.ac.id

driving proactive climate action (Global Center on Adaptation, 2021). These local efforts address immediate environmental issues and contribute to achieving national climate targets, making forest protection a global concern.

The "Local Heroes for Forest Protection" program, organized by the American-Indonesian Scholarship Program Alumni Association (ALPHA-I), empowers 90 youth aged 15-22 from Southeast Sulawesi, West Papua, and East Nusa Tenggara. These participants, primarily high school and university students, will lead local future climate projects and advocate for forest conservation. The program aims to indirectly impact 900 others, with each participant sharing knowledge through local campaigns. During the year-long project, a key objective is to preserve 9 hectares of planned forest land across the three provinces. That preserved area will contribute to carbon sequestration while maintaining biodiversity.

2. METHOD

2.1 Program implementation strategies

We set five objectives to support the program's goal (Attachment 1). As ALPHA-I representative (alumni), the field coordinator conducted surveys and worked with local environmental groups to ensure sustainability and protect 3 hectares of forest at each location. The three Indonesian sites were chosen for their distinct forest conservation challenges: Kendari (Southeast Sulawesi) faces land conversion for urban development, Manokwari (West Papua) struggles with forest and land fires, and Labuan Bajo (East Nusa Tenggara) is impacted by climate change affecting the Komodo dragon's habitat.

2.2 Program timeline

The program follows a structured timeline to engage, educate, and empower local youth in forest conservation (Table 1). Activities are designed to raise awareness and equip youth with skills to address climate change impacts, particularly in forest conservation. In August, we, as ALPHA-I representatives (alumni), coordinated with local groups; from September to October, we provided online training on climate change, leadership, and campaign strategies. From November to April, youth groups implemented the program, followed by the Climate Action Festival in May to showcase their projects. In June, we focused on sustainability; in July, we evaluated outcomes

and documented lessons learned. This approach ensures the program's effectiveness and long-term impact.

2.3 Promotion and collaboration

We used digital and conventional media to promote the "Local Heroes for Forest Protection" program. This included leveraging ALPHA-I's website and social media (e.g., Instagram: @jagahutan.id) and partnering with local media to boost visibility. A campaign partnership with the US Consulate General in Surabaya enhanced outreach in eastern Indonesia. Local media also highlighted program milestones to educate and inspire the community on forest protection and youth involvement in environmental stewardship.

The program collaborated with various stakeholders across three locations. In Kendari (Southeast Sulawesi), partners included the TERAS community, Faculty of Forestry and Environmental Sciences Universitas Halu Oleo, BPDAS Sampara, DAS Forum Southeast Sulawesi, and the Regional Mangrove Working Group. In Manokwari (West Papua), collaborators included the Faculty of Teacher Training and Education Universitas Papua, Kampung Bakaro, LSM Bentara Papua, and BPDAS West Papua. In Labuan Bajo (East Nusa Tenggara), support came from Young Catholics PAROKI Roh Kudus Labuan Bajo and Young Catholics PAROKI Wae Sambi.

3. RESULT AND DISCUSSION

3.1 General program implementation

A total of 98 youths participated in a virtual kickoff event among three selected provinces, motivated by a desire for environmental advocacy, skill development, and community engagement. Youth participation is driven by a commitment to environmental sustainability, focusing on tree planting, forest preservation, and combating climate change. The program also provides opportunities for educational enrichment, skill development, community engagement, personal growth, and networking. The process of establishing the youth group and defining engagement modalities is underway and is being led by the ALPHA-I members who facilitated the consultation. This initial event is key to attracting and engaging youth for the program's online campaign and on-site activities (United Nations Development Programme, 2022).

Table 1. The one-year program timeline (2023-2024)





Figure 1 . Capacity building activities in Kendari, Manokwari, Labuan Bajo

The hybrid workshops, with 59 participants (26 online and 33 in-person), aimed to equip young people with the skills to implement climate change and forest conservation projects (Figure 1). The sessions introduced Human-Centered Design (HCD), focusing on identifying local issues and opportunities. Topics on climate change included distinguishing between climate and weather, understanding climate change, identifying its causes and greenhouse gas emissions, and exploring mitigation and adaptation strategies.

The program met key outcomes for objectives 1 and 2. First, 84% to 88% of participants understood climate change, distinguishing it from weather and recognizing the components of climate. However, technical knowledge of greenhouse gas emissions remained limited. Still. 84% recognized the importance of tree planting to reduce CO_2 levels. Second, social media proved essential for advocacy, helping mobilize support for forest protection and sustainable management. Third, the program utilized Human-Centered Design (HCD) to create user-centric Fourth, it emphasized the complexity of solutions. forest ecosystems and their role in ecological balance. Finally, participants learned the value of responsible tree management and environmental stewardship, including waste disposal, conservation advocacy, and reforestation efforts. Securing knowledge resources and institutionalizing youth participation mechanisms are crucial for successful program implementation (United Nations Development Programme, 2022; United Nations Children's Fund, 2023).

3.2 Program implementation in Kendari Southeast Sulawesi

The first workshop, with 24 participants, focused on

preparing local heroes for their project. It included group discussions on forest and environmental issues, exploring conservation solutions, and creating action plans. Participants gained a deeper understanding of the forest ecosystem, the importance of harmony between forests, biodiversity, and humans, and the impact of human activities. They also shared local examples and collaborated in groups to develop action plans, receiving feedback for improvement.

The second activity, "Harmony in Action: Empowering Youth for Sustainable Futures," engaged 100 participants in mangrove planting and environmental education (Figure 2). The main attraction is its mangroves, which need preservation and sustainability to boost the local economy while conserving the area (Idrus et al., 2023; La Sara et al., 2011). Participants planted around 1,000 mangrove seedlings over one hectare and attended a sharing session led by Halu Oleo University. Wouter Housen, Deputy Public Diplomacy Officer at the US Consulate in Surabaya, praised the initiative's role in the US-Indonesia partnership, promoting collaboration among alumni, government, academia, and communities. The River Basin Management Agency (BPDAS) Sampara also expressed strong support. The session covered key environmental topics, gender, and conservation, inspiring students with capacity-building opportunities. A followup evaluation in mid-2024 showed the mangroves' 50-60% survival rate due to sea currents.



Figure 2 . Planting activity in Kendari, Southeast Sulawesi

Besides planting, in Kendari, program participants engaged beyond mere planting activities to foster networking and ensure the program's local sustainability. These Local Heroes participated in a communal planting event commemorating Indonesian Tree Planting Day, The event saw the organized by BPDAS Sampara. participation of 200 individuals, including staff from regional branches of Ministries, provincial agencies, NGOs, and students, planting trees in a 5-hectare area belonging to the Islamic Center Muadz Bin Jabal. To further ensure the continuity of the program's impact, Local Heroes were incorporated into working group action plans, specifically in sectors focused on planting, education, and awareness campaigns. This strategic move aims to maintain the momentum of the ALPHA-I efforts. A significant achievement in these endeavors is the recognition of Local Heroes as key stakeholders in the conservation of mangrove

forests in Southeast Sulawesi.

3.3 Program implementation in Manokwari - West Papua

The first workshop, attended by 33 participants, aimed to prepare them for project work through interactive discussions and action plan development. Key topics included the importance of watershed management and youth leadership in forest protection. Participants discussed environmental issues in West Papua, using local knowledge to develop solutions and emphasizing the need for collaboration between local groups and the government. They expressed strong interest in leading forest protection efforts and inspiring others while providing feedback on the workshop's logistics. The teamwork and enthusiasm showed readiness to tackle forest challenges in West Papua.



Figure 3 . Planting activity in Manokwari, West Papua

The second activity, tree planting and environmental education, took place in Bakaro Village, Manokwari Barat, with 36 participants (Figure 3). Bakaro was chosen for its accessibility, strong partnership with UNIPA University for student practicums, and the pressing need to address beach abrasion. The planting focused on four tree species: Trembesi (Samanea saman) for shade and soil conservation, Ketapang Kencana (Terminalia catappa) to combat beach erosion, Red Shoot (Pucuk Merah) (Syzygium oleana) for its aesthetic and ecological benefits, and Matoa (Pometia pinnata), a fruit tree that supports local biodiversity. This initiative aims to address environmental issues and enhance ecosystem resilience. With Papua facing illegal logging and deforestation and much of the land managed by Indigenous communities under customary law, ongoing collaboration with locals and adopting local knowledge is essential (Forest Watch Indonesia, 2019). Our program also aligns with and supports the Manokwari Declaration to conserve Papuan forests (Cámara-Leret et al., 2019).

3.4 Program implementation in Labuan Bajo -East Nusa Tenggara

The first workshop, attended by 41 people, focused on interactive discussions, exercises, and field visits. Topics included Youth Engagement and Community Development, with group discussions on local environmental issues, solutions, partnerships, and action plans. Participants also received training in social media campaigns. Key outcomes included: (1) understanding forest rehabilitation and its challenges, (2) identifying local environmental issues, (3)

proposing practical conservation solutions, (4) emphasizing youth leadership in forest protection, (5) creating action plans, and (6) providing feedback on the workshop's design and effectiveness for future activities like mangrove planting.



Figure 4 . Planting activity in Labuan Bajo, East Nusa Tenggara

In early 2024, the Catholic Youth Council of PAROKI Roh Kudus Labuan Bajo, in collaboration with PAROKI Bunda Maria Wae Sambi, organized a tree planting and environmental education event with 50 participants (Figure 4). They planted 100 bamboo seeds under the theme "Youth Ecological Worship and Action: Planting with Heart, Caring with Sincerity" theme to promote local forest conservation and climate change mitigation. Internal planning meetings were held on January 28 and February 25, 2024, to ensure the event's success.

Our program supported the government's Youth Conservation Agent initiative under the Ministry of Environment and Forestry (Direktorat Jenderal Konservasi Sumber Daya Alam dan Ekosistem, 2024). In 2024, the Komodo National Park Office in Labuan Bajo also established Youth Conservation Agents to share information and serve as independent role models for environmental preservation (Haynes & Tanner, 2015).

3.5 Sustainability workshop

The sustainability workshop in Jakarta, attended by 12 participants, brought together local heroes from Kendari, Labuan Bajo, and Manokwari. Representatives from each region, including Sri Mauliani, Laode Darfin Idhar, Alfian Lawi (Kendari), Rikyardus Efendi Gere, Emanuel Rizan Pryatno (Labuan Bajo), and Irvandi Benediktus Sareng, Riana Karubuy (Manokwari), worked with ALPHA-I to develop a sustainability action plan and explore resources

Strength	Weakness	Opportunities	Threat	
Kendari - Southeast Sulawesi				
 25 local heroes Diverse skills/education Experience in implementing conservation programs Familiar in social media Existing community awareness Hybrid flexibility Sustainable program resources 	 Limited funding Inconsistent commitment Lack of resource persons Time matching Motivation is more ceremonial 	 Many local partners (Komunitas Teras, FHIL OHO, BPDAS Sampara, Forum DAS Sultra, Pokja Mangrove Daerah) Facilities of local partners Collaboration programs of local partners Transformation of local heroes into local conservation agents Community involvement 	 Inconsistent regulations Extreme weather Unsupportive regulations/policies Influencing many people Changes in institutional leadership Land-use change 	
Manokwari - West Papua				
 Strong and extensive networking Young and enthusiastic members Experience in implementing conservation programs University vision and mission 	 Facilities related to environmental programs Lack of waste management skills Betel nut chewing culture Low public awareness Lack of government concern 	 Collaboration with external parties Availability of land Presence of arboretum 	 Customary rights in waste management Foreign/local companies Climate 	
Labuan Bajo (East Nusa T	enggara)			
 Active youth organization Existing church movement Young people in Catholic Youth Organization are environmental conscious and concerned Easy coordination among the youth 	 Busy schedules Work commitments School (education) Project members relocating, reducing personnel Not all young people have a social spirit for social activities Time management is still difficult 	 Support from the Church (Ruteng Diocese) through the youth commission's "Integral Ecology" program Support from the local government Support from other NGOs and communities in Labuan Bajo Collaboration opportunities arising from previous social actions Support from schools in Labuan Bajo Community willing to listen to church authorities in carrying out ecological actions 	 Unpredictable climate Green lands being privatized Changing government revitalization programs Green lands already controlled by private entities 	

Table 2 SWOT analysis for each province

for long-term support. The workshop featured expert presentations on sustainability strategies, a SWOT analysis (Gürel, 2017), and group discussions using design thinking techniques to brainstorm and strategize for the project's future.

The SWOT analysis across three provinces revealed common issues (Table 2). Shared conservation activities strengthen programs (Johnson et al., 2013), while limited awareness and funding remain weaknesses (Hilal, 2023). Action plans were developed to address these, with a focus on collaboration with local and national organizations to expand environmental impact (Attachment 2).

3.6 Youth climate action festival

The event concluded with a national gathering at @America (https://atamerica.or.id/), with 550 attendees (148 in person and 400 online) to cover objective 5 of the program. The "Local Heroes for Forest Protection" program aimed to empower youth-led environmental projects in Kendari, Manokwari, and Labuan Bajo by showcasing local initiatives, connecting youth with national networks, and facilitating collaboration with

Location	Target Three Provinces	Actual Total Youths Participation	Stakeholders Involve	Planted Species, Trees, and Area (ha)
Kendari - Southeast Sulawesi	 Engaging 30 participants Conserving 9 hectares of forest Reaching 900 people 	 75 direct participants 200 indirect participants for collaborative events 	 Komunitas TERAS The local government (Watershed Forum of Southeast Sulawesi Province Kendari Botanical Garden) The School of Forestry and Environment at the University of Halu Oleo 	 1,000 mangroves planted 1,000 more mangroves through collaborative events 6.5 ha
Manokwari - West Papua	-	• 33 participants	• Universitas Papua in Manokwari	 70 trees (Trembesi, Ketapang Kencana, Pucuk Merah, Matoa) 3 ha
Labuan Bajo - East Nusa Tenggara	-	• 41 participants	 The Catholic Youth at PAROKI The Catholic Youth at Wae Sambi 	100 bamboos3 ha
Online	-	• 4508 engagement	 Social media and news (Instagram: @jagahutan.id & @alphai.official) 	-
Total	-	 149 youths directly benefited 200 more indirectly engaged 	-	 1,170 trees planted through ALPHA-I activities 1,000 trees planted through collaborative efforts

Table 3. Summary of program implementation and impacts

partners. The event included a talk show highlighting successful projects and networking with national organizations. It celebrated local achievements, shared best practices, and established partnerships for future sustainability efforts, with plans for field workshops, monitoring, and ongoing publications.

3.7 Achievement summary

The program, which involved many participants and tree planting, as presented in Table 3, revealed both enablers and challenges. Key challenges included: (1) remote locations in eastern Indonesia, making coordination difficult, (2) competing commitments of ALPHA-I members and youth participants, leading to delays, (3) lack of local forestry expertise in areas like Manokwari and Labuan Bajo, affecting tree planting success, and (4) unpredictable weather, with irregular rain reducing seedling survival rates.

We surveyed 73 out of 149 direct beneficiaries, with 65.8% female and 34.2% male respondents. We assessed knowledge, attitude, and practice improvements using before-and-after questionnaires. An improvement in knowledge was defined as answering more than 30% of climate-related questions correctly and showing progress in at least three out of five knowledge questions. For attitude and practice, improvement was defined by a change from "no" to "yes" in three out of five questions. Results

showed 45% of participants gained knowledge about climate change, 22% improved their attitudes, and 56% showed increased actions, such as deforestation prevention. The low attitude but high action may reflect peer pressure, with youth participating in activities even if they do not fully believe in their impact.

3.8 Future plans

There are two main future plans. First, we aim to sustain local heroes' actions by supporting plant monitoring, conducting sustainability workshops where national event participants share SWOT analyses and sustainability plans, and building local network connections. Second, we will promote the project on social media to raise awareness among other youth. Additionally, with potential funding, ALPHA-I's environmental division will expand the project to reach nine more youth groups (about 2,700 people) and help conserve 27 hectares over three years (2025–2027). Currently, we have discussed with several local and national governments and non-government organizations who work in environmental issues to support our future program, given their interest in the impact of our program implementation.

4. CONCLUSION

During our one-year "Local Heroes for Forest Protection" program, we integrated local knowledge to raise awareness

and empower youth to tackle global climate change. Across three provinces, we successfully benefited 149 youths and indirectly engaged 200 more, resulting in 1,170 trees planted and an additional 1,000 trees through collaborative efforts with 11 local and national organizations. Despite challenges such as time management and lack of human resources, feedback from stakeholders was largely positive, supporting the program's continuation and expansion. Ongoing evaluation and extending the program to other regions with broader networks are vital. We hope to collaborate more with other local and national stakeholders, and other interested groups are very welcome to implement a similar program while we maintain and continue the current program for another year.

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CONFLICT OF INTERESTS

The authors declare there is no conflict of interest.

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Goal

ATTACHMENT

Attachment 1. The program goal and detailed activities for each objective

To support 90 youth from three local groups in Southeast Sulawesi, West Papua, and East Nusa Tenggara, empowering them to lead climate initiatives and become local champions for forest conservation

Objective	Activity	Output	Indicator	Desired Outcome	Method
1. Gaining a deeper understanding of climate change and its impacts	Climate change mitigation and adaptation workshops (World Health Organization, 2015)	90 youth from 3 local groups are trained in climate change mitigation, adaptation, and their link to forest conservation	Participants gain knowledge on: • The scientific causes of climate change • The difference between mitigation and adaptation • The relationship between forests and climate change	Knowledge growth	Pre-test and post-test, sample interview
2. Identifying local climate change mitigation and adaptation actions related to forests	Conducting a Human Centered Design (HCD)/ design thinking workshop (IDEO, 2015)	90 youth from 3 local groups are trained in climate change mitigation, adaptation, and their link to forest conservation	Each youth group provides a document listing the desired outcome items	Participants generate a list of: • Local problems • Local opportunities • Potential solutions	Report submission
3. Mentoring and supporting local activities to raise awareness of 900 people and conduct conservation on 9 hectares of forest	Conducting advocacy and campaign workshop (Save The Children, 2019)	90 youth from 3 local groups are trained in advocacy and campaigning	Participants learn: • Examples of effective campaign strategies • How to develop a list of potential local campaign activities	Knowledge growth. Developing a list of potential campaign activities	Pre-test and post-test, sample interview
	Assisting the youth groups to conduct their campaign and conservation activities	90 youth groups engage 900 people to raise awareness about climate change and forest protection, while conserving 9 hectares of forest	Number of people reached online and in-person through campaign activities, and the area of land conserved through youth action	900 local people have increased awareness of climate change and forest conservation, while 9 hectares of forest are conserved	Survey, social media view, and sample interview
4. Connecting to local efforts to sustain forest protection	Meetings with local environmental groups	Youth groups are linked with local environmental organizations	Meetings are held, and an action plan is developed	Youth groups and local environmental organizations develop collaborative action plans	Document action plan

Continuation of Attachment 1.

Objective	Activity	Output	Indicator	Desired Outcome	Method
5. Connecting with national youth networks focused on climate change and forest conservation	Youth climate action festival	A festival is held with at least 15 national youth network representatives and 15 organizations supporting environmental and climate action	Number of new connections made by youth groups and pitches conducted	3 youth groups are connected to national networks and pitch their ideas to potential collaborators	Activity report from local youth groups and interview samples from festival participants. Final survey for program evaluation

Short-Term (6-12 months)	Medium-Term (18-36 months)	Long-Term (36-60 months)
Kendari - Southeast Sulawesi		
 Target stakeholders: Students/youth, local heroes, existing local partners Supporting stakeholders: Community, government, NGOs, youth Online advocacy Communication, information, education Regular meetings Joint planting events Transformation of local heroes into local conservation agent Monitoring and evaluation of 	 Target stakeholders: Local heroes, NGOs, existing local partners, schools (students & teachers), donors/sponsors Supporting stakeholders: Students/universities, government Regular meetings of local heroes Joint planting events Fundraising Online workshops Local heroes back to schools 	 Target stakeholders: Local partners, students, mass media, media partners, environmental activists Supporting stakeholders: Organizations, bureaucracy Mangrove planting Youth movement of local heroes
planting programs		
 Target stakeholders: Students Involved stakeholders: FKIP and schools Knowledge sharing, deployment, activities 	 Target stakeholders: District government Involved stakeholders: Terang Papua, Belantara, Bintuni district, Arfak Mountains district Community service, monitoring short 	 Target stakeholders: University community Involved stakeholders: - Campus policy on smoke-free and plastic-free canteens Faculty-level waste segregation Students as agents of change
Labuan Bajo - East Nusa Tenggara		
 Empowerment of internal/group (Catholic Youth) Monitoring of ongoing programs Increasing ecological awareness through training and Knowledge sharing Target stakeholders: OMK Kota Labuan Bajo, OMK mentors Collaboration stakeholders: Church Youth Commission 	 Collaborate with other communities and schools Efforts to reach groups outside community Target stakeholders: Video community, Kel- Teater Siapa Kita, high schools/vocational schools in Labuan Bajo Collaboration stakeholders: Provincial and district education offices, relevant agencies (environment), local government 	 Collaborate with government and private sectors Collaborate Increase green areas as a result of youth ecological activities Target stakeholders: local government, OMK groups outside Labuan Bajo, Mabar district tourism office Collaboration stakeholders: Ruteng Diocese, local government