Pursuing underlying values: A community value-based approach to 'Hijau Manise' greening program in East Sumba, East Nusa Tenggara

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Abstract. Since 2019, East Sumba has faced extreme drought, exacerbating poverty and food insecurity. Greening initiatives, by fostering microclimate regulation, offer a potential solution to induce rainfall and improve soil fertility, thereby supporting sustainable agriculture. Despite various past greening initiatives, many have failed due to technical challenges (low rainfall, high evaporation rates, and rocky terrain) and social barriers (lack of community attachment to the planted trees due to delayed benefits).To address these challenges, this study adopts a Participatory Action Research (PAR) approach across seven villages in five sub-districts of East Sumba. The research specifically examines how Hijau Manise, a CSR initiative by PT Muria Sumba Manis, integrates a community value-based approach in its planning and implementation. A qualitative approach, incorporating in-depth interviews, FGDs, and observations, was used to analyze emerging values that influence community engagement with the planted trees. To ensure validity and reliability, findings were triangulated across multiple data sources, validated with stakeholders, and refined through iterative reflection cycles. Findings reveal that prosperity and social justice are the most influential values in fostering long-term community commitment, while liberty and sustainability serve as supporting enablers. The study underscores the importance of continuous stakeholder involvement at every stage—from planning to evaluation—to ensure sustainable and community-driven greening efforts.

1 Introduction

In 2019, a severe drought occurred in East Sumba Regency, East Nusa Tenggara Province, due to an extended dry season. According to records from the Kupang Climatology Station, 249 days in 2019 were classified as rainless [1]. This extreme drought has posed a critical challenge, exacerbating poverty and food insecurity in the region. A study by the Food and Agriculture Organization (FAO) on the impact of disasters and crises on agriculture and food security revealed that, globally, 82% of the effects of drought are concentrated in the agricultural sector [2]. Drought can lead to short- to medium-term water scarcity, extreme

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heat stress on livestock and crops, and reduced agricultural productivity, including fodder availability. Prolonged or recurring droughts may trigger long-term effects, such as soil degradation, seawater intrusion into rivers due to reduced water flow, and ecosystem damage. When compounded by socioeconomic challenges or conflict, droughts often become catalysts for some of the most severe instances of famine in history.

Greening initiatives represent a vital strategy for addressing environmental crises. These efforts play a pivotal role in modifying local microclimates and mitigating drought conditions. They not only enhance biodiversity and restore ecosystems but also contribute to climate resilience by influencing precipitation patterns [3][4], regulating temperature [5], and improving water availability [4].

Numerous greening programs have been implemented in East Sumba but have failed due to technical and social factors. Technical challenges include low rainfall, high evaporation rates, and rocky terrain, which hinder tree planting. Sumba is characterized by a semi-arid climate with insufficient rainfall, making it difficult for newly planted trees to establish and thrive. The region has experienced prolonged dry spells, exacerbated by climate phenomena like El Niño, which disrupts normal rainfall patterns [6]. The high temperatures and arid conditions lead to significant evaporation, further reducing the moisture available for young trees. This challenge is compounded during periods of extreme heat, resulting in increased stress on plants. The physical landscape of East Sumba includes rocky and uneven terrains that complicate the planting process. This makes it difficult to prepare suitable sites for tree growth, limiting the areas where trees can be successfully established.

Socially, community attachment to the planted trees is lacking because the benefits are not immediately perceived [7]. Many community members do not perceive immediate benefits from the greening initiatives, leading to a lack of emotional investment in the planted trees. This detachment can result in neglect or abandonment of the trees once planted. Limited community engagement is also a problem, and programs have often failed due to inadequate involvement of local communities in decision-making processes. Without active participation and input from community members, initiatives may not align with local needs or values [8]. Another problem is that some greening efforts do not consider the cultural significance of certain species or practices within the community, leading to resistance or lack of interest in maintaining the planted trees.

However, community engagement is crucial for the success of greening programs. The "Hijau Manise" program aims to plant trees in East Sumba from the year 2023 to 2027 as part of the Corporate Social Responsibility (CSR) program undertaken by the sugarcane plantation company PT Muria Sumba Manis. The Hijau Manise Program is a community-based greening initiative where the community is not only the recipient and planter of trees but also actively involved in planning, selecting tree species, and developing mechanisms for plant maintenance and monitoring.

This study addresses the limitations of past greening programs, which lacked strong community engagement, by exploring how a community value-based approach can foster stronger attachment to planted trees and ensure long-term sustainability. This study aims to explore how the Hijau Manise Program implements community-based greening initiatives and to identify the core values upheld by the community that contribute to a successful and sustainable greening program. While four key values (prosperity, liberty, social justice, and sustainability) were considered in this study, our findings highlight prosperity and social justice as the most dominant factors.

This research also contributes to the discourse on community-based environmental programs by:

1. Introducing a community value-based approach by highlighting how local values (especially prosperity and social justice) can enhance long-term engagement in greening initiatives.
2. Applying the Participatory Action Research (PAR) cycle by showing how iterative planning, action, observation, and reflection improve community ownership of the project.
3. Providing empirical evidence from East Sumba, a region with unique socio-environmental challenges, illustrating the role of cultural and economic factors in greening program sustainability.
4. Offering practical recommendations for CSR programs and demonstrating how corporate-sponsored initiatives can align with local community values to ensure long-term success.

2 Methods

This study employs Participatory Action Research (PAR), a research strategy that integrates research with action and active stakeholder participation in the field. In PAR, individuals and institutions—referred to as stakeholders—collaborate as equal partners to identify challenges, develop solutions, and drive social change. PAR was chosen for this study because it not only enables qualitative data collection but also fosters community engagement by actively involving participants in co-developing solutions. This participatory approach enhances stakeholder ownership of greening initiatives, increasing the likelihood of long-term success and sustainability.

2.1 Study area

The research was conducted across seven villages in five sub-districts of East Sumba Regency, East Nusa Tenggara Province: 1) Wanga village – Umalulu subdistrict; 2) Patawang village – Umalulu subdistrict; 3) Lambakara village – Pahunga Lodu subdistrict; 4) Palanggai village – Pahunga Lodu subdistrict; 5) Tanaraing village – Rindi subdistrict; 6) Matawai Maringu (Kahaungu Eti subdistrict); and 7) Palakahembi – Pandawai subdistrict. These villages selected are categorized as the company's ring-1 areas, which are prioritized for Corporate Social Responsibility (CSR) activities. The research was conducted from January 15 to August 31, 2024.

2.2 Research stages model

PAR has many models from various authors. This study used the cyclic model, which has four steps: plan, act, observe, and reflect, to describe the action research process by Kemmis and McTaggard [9].

2.2.1 Planning

It involves identifying the issue or the problem that needs to be changed. Information is gathered from various sources to understand the problem better. The issues identified for this research are drought, poverty, rocky soil, and free-roaming livestock. The subject of the research is every stakeholder that will actively participate in the program: Village head, neighborhood head, leader of a community, Dasawisma, school principal, church leader, Indonesian Social Sustainability Forum (ISSF), PT Muria Sumba Manis, KODIM

1601/Sumba Timur, and Polsek Umalulu. In this step, we also collect information from project reports and previous studies to understand the extent of the problem in that area.

2.2.2 Acting

This step involves collecting data from the subjects before applying the actual action plan to get an idea of the situation. This is followed by applying the action plan to create change. After implementing the action plan, data is collected to analyze the effect of the action. Data is collected through observation, in-depth interviews, and FGDs conducted in each village.

For this research, we use trees as intervention tools. The intervention is implemented by planting trees using various methods created by villagers/community members. The community decides the sort of trees to be planted based on economic values, tree functions, and the suitability of the planting place.

2.2.3 Observing

This step involves analyzing the data collected and discussing the findings with a co-researcher to improve interpretation and prepare the study's report. The data are analyzed using qualitative methods. All of the data are categorized as values formation of community planning [10]: 1) Prosperity guarantees life-sustaining resources while also driving innovation and collaboration among communities; 2) Liberty encourages individual innovation, freedom of choice, and communal resilience while fostering mutual respect and the preservation of rights; 3) Justice balances individual rights with collective welfare, emphasizing fairness, equality, and resource distribution; and 4) Sustainability emphasizes the importance of protecting natural and social resources to preserve future generations' well-being.

This research observes how the community identifies suitable plant species, selects planting locations, establishes distribution and planting schedules, implements techniques for creating planting holes, formulates maintenance mechanisms, delineates harvest beneficiaries, and assigns responsibilities for monitoring activities.

2.2.4 Reflecting

In the reflecting stage, the first action research cycle is evaluated, and the process is revised if necessary. Then, the new strategy is implemented and evaluated until the desired result is obtained.

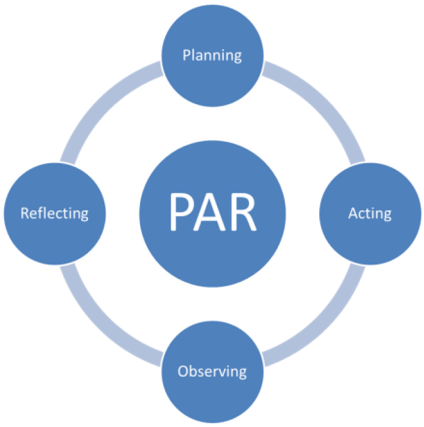

Fig. 1. Participatory Action Research Cycle.

To ensure the validity and reliability of results at each stage of the research, the following measures were applied: 1) triangulation of data sources – multiple data collection methods (in-depth interviews, FGDs, and observations) were used to cross-verify findings; 2) stakeholder validation – findings were presented to local stakeholders (village leaders, community representatives, and ISSF facilitators) for validation and refinement; 3) reflexivity in research – the reflecting phase of the PAR cycle enabled continuous assessment and iterative adjustments based on community feedback; 4) Longitudinal observation – multiple cycles of reflection were conducted to ensure the consistency and reliability of community responses and tree survival rates. These measures strengthened the credibility of the qualitative analysis applied in this study, ensuring the accurate categorization of key community values that influence engagement in the greening program.

3 Results and Discussion

3.1 Geographical context of the location

East Sumba Regency, located in the eastern part of Sumba Island in East Nusa Tenggara Province, covers an area of approximately 7,000 km². The region's topography is dominated by hills and mountains stretching from north to south, interspersed with fertile lowlands in certain areas.

Rainfall in East Sumba varies. The rainy season lasts from November to April, followed by a prolonged dry season from May to October. The average annual rainfall is about 1,000–1,500 mm, but its uneven distribution often results in drought in some areas.

East Sumba's landscape also features small rivers, grasslands, and distinctive savanna forests. This natural beauty offers significant potential for agriculture, livestock, and eco-tourism, with its stunning scenery and rich biodiversity. This diversity makes East Sumba unique, presenting significant challenges and opportunities in environmental management and regional development.

The hilly and mountainous terrain poses challenges and opportunities for the local community, particularly in subdistricts bordering PT MSM: Umalulu, Kahaungu Eti, and Pahunga Lodu. Most residents in these areas are engaged in agriculture, livestock, and fisheries, which are highly dependent on the sustainability of natural resources. However, environmental challenges such as land degradation and climate change threaten this

sustainability. The emerging impacts of climate change, including prolonged drought, also heighten the population's risks of hunger and malnutrition.

Greening programs and planting productive trees play a crucial role in maintaining ecosystem balance and ensuring the sustainability of local livelihoods. These initiatives aim to improve environmental quality and enhance the community's quality of life by increasing agricultural and livestock productivity. In an area with limited access to education and healthcare, the support of a healthy environment is essential for development.

Tree-planting greening programs also align with the strong local culture. Communities influenced by the *Marapu* tradition in East Sumba are deeply connected to nature and their ancestral customs. Planting activities can become part of traditional ceremonies and religious rituals highly respected by the local community.

3.2 Socio-cultural context, local wisdom, and community involvement

East Sumba, a region rich in culture and tradition, possesses a socio-cultural context closely tied to environmental preservation and local wisdom. The people of East Sumba maintain a strong connection to nature, evident in various aspects of their daily lives, from agricultural practices and forest management to the production of their renowned *tenun ikat*.

In East Sumba, local wisdom passed down through generations plays a crucial role in environmental conservation. The Indigenous communities, many of whom adhere to the Marapu belief system, practice rituals and traditions that honor nature as an integral part of their lives. This belief system encourages them to maintain ecological balance and use natural resources wisely.

Traditions such as customary ceremonies and religious rituals often involve paying homage to trees and forests. The community believes that preserving forests and planting trees is a way to honor their ancestors and the deities they believe safeguard nature. This local wisdom underpins many conservation practices that are still observed today.

Natural resources, particularly from agriculture, gardens, and forests, form the backbone of the East Sumba economy. Staples like rice, corn, cassava, and various horticultural crops are primary food sources. Additionally, forest products such as timber, rattan, and natural dyes for weaving threads are vital to the community's economic and cultural life.

East Sumba's renowned *tenun ikat* production requires natural dyes sourced from various forest plants. These natural dyes provide a unique characteristic to the woven fabrics, making them cultural products with significant economic value. Therefore, the sustainability of natural resources for producing natural dyes is crucial for the continuity of the traditional weaving industry.

In the socio-cultural context of East Sumba, greening and tree planting are ecological necessities and social and economic imperatives. Greening programs help address environmental issues such as soil erosion, drought, and declining soil quality, which are common challenges in the region. By planting trees, communities can improve soil conditions, enhance water absorption, and maintain the availability of clean water. Economically, the fruit trees planted can increase household income and generate derivative products.

Greening efforts are also essential for preserving the raw materials used in natural dye production for *tenun ikat*. By planting and maintaining plants that yield natural dyes, the community can ensure the sustainability of the traditional weaving industry, which is a vital part of their cultural identity.

The success of greening programs largely depends on active community participation. Their involvement in planting and caring for trees ensures the program's effectiveness and sustainability. The openness of East Sumba's people to newcomers and new ideas, their spirit

of cooperation (*gotong royong*), and their respect for local customs provide a strong foundation for them to become agents of change in environmental conservation efforts. By leveraging local wisdom and traditional beliefs, greening programs can seamlessly integrate into their daily lives, creating a relationship between environmental preservation and improving social and economic well-being.

The socio-cultural context of East Sumba highlights the deep interconnection between environmental conservation and local wisdom. The community's reliance on natural resources, particularly for agriculture and *tenun ikat*, underscores the importance of greening and tree-planting initiatives.

3.3 Government Policy Context in East Sumba (RPJM 2021–2026)

The Medium-Term Development Plan (RPJM) of East Sumba Regency for 2021–2026 [11] highlights several strategic issues, one of which is improving environmental quality. East Sumba, characterized by its hilly, mountainous, and lowland landscapes, faces significant challenges in maintaining ecological balance and the sustainability of its natural resources. The high rate of deforestation, land degradation, and the impacts of climate change pose serious threats to the region's environment and the well-being of its communities.

To address these challenges, the RPJM 2021–2026 emphasizes several priority programs to improve environmental quality in East Sumba Regency. Greening and reforestation programs are among the main focuses, targeting tree planting on degraded lands to restore damaged ecosystems and prevent soil erosion. These efforts are also expected to enhance water absorption, reduce the risk of flooding, and support the community's access to clean water.

The RPJM 2021–2026 also includes efforts to strengthen institutional capacity and community participation in environmental conservation. Strategic steps include environmental education in schools, training for local communities, and the involvement of indigenous communities in natural resource management. These initiatives aim to build collective awareness and commitment toward environmental protection.

3.4 Hijau Manise Program

Manise Sumba Timur is a community empowerment initiative by PT Muria Sumba Manis (PT MSM) that integrates the company's business operations with the lives of the local community, emphasizing social and environmental sustainability. MANISE is an acronym for *Masyarakat Harmonis* (Harmonious Community). The acronym *Manise* was chosen to align with the vision and mission of PT MSM.

The company's vision of bringing the sweetness of life to everyone and its mission to create added value for stakeholders is the foundation for developing the Manise Sumba Timur program.

As a community empowerment initiative integrated with the company's business operations, the mission of the Manise Sumba Timur program is divided into three main focuses: environmental conservation, cultural transformation, and economic independence. This mission serves as a guide for the participatory planning and implementation of the program in collaboration with the community, intending to foster a harmonious and prosperous East Sumba community. Their missions are: 1) Environmental Conservation – Contribute to community-based environmental preservation; 2) Cultural Transformation – Contribute to improving the quality of life while upholding the wisdom of local values; 3) Economic Independence – Contribute to enhancing community economic self-reliance based on the strengths of local potential.

The Hijau Manise program is a community-based greening initiative launched by PT MSM as part of the broader Manise Sumba Timur program. Several contextual factors—including geographical, socio-cultural, local wisdom, government, and corporate policies—serve as the foundation for setting the program's goals and activities.

The Hijau Manise Program aims to create a harmonious and prosperous community through environmental conservation (planting protective and productive trees) and the empowerment of local communities. Its implementation is designed considering local contexts and the wisdom of the assisted communities, ensuring its relevance and sustainability in daily life.

PT MSM's greening activities (enrichment planting) have been ongoing since 2019. Hijau Manise was officially introduced in 2024 as part of the broader community empowerment initiative, Manise Sumba Timur.

The Hijau Manise program is carried out within the company's premises (internal locations) and in community areas (external locations). From 2019 to 2023, the company's internal team implemented the program. However, starting January 2024, the internal locations will continue to be managed by the company's internal team, while the external locations will be handled by the Indonesian Social Sustainability Forum (ISSF) with the PAR method. Below are the details of the number of trees planted during 2019–2024.

Table 1. Tree Planted 2019-2024 in Hijau Manise Program

No.	Year	Location	Type of Trees	Amount	Area Size (Ha)
1	2019	Wanga	Mango and Jackfruit	1.000	2,5
2	2019	River Bassin (DAS) Bulla	Candlenut, Moringa, Indian Beech	1.100	1
3	2019	River Bassin (DAS) Mata	Candlenut, Moringa, Indonesian Bay Leaf	783	5,02
4	2019	Internal Company Area	Rain Tree, Royal Poinciana, Mango, Jackfruit	1.155	25,99
5	2023	Internal Company Area	Rain Tree, Mango, Jackfruit	981	9,5
6	2024	Internal Company Area	Rain Tree, Jackfruit, Tabebuia, Sumba Cherry Blossom, Royal Poinciana, Mango, Longan, Crystal Guava, Candlenut, Durian	2.030	32,66
7	2024	Wanga, Patawang, Lambakara, Palanggai, Tanaraing, Matawai Maringu, Palakahembi	Rain Tree, Jackfruit, Mango, Longan, Crystal Guava, Sapodilla, Cashew	7.387	39,81
TOTAL				14.436	116,48

Source: Primary Data

3.5 Stakeholder Identification

The Hijau Manise Team visited the selected villages to conduct program socialization for the Hijau Manise initiative. The village heads were initially visited to introduce the team, which consisted of ISSF and PT MSM members. In addition to introductions, the team explained the program's objectives and discussed the villages' development progress and potential areas for collaboration within the Hijau Manise activities. During these socialization sessions, all village heads responded positively to the program and agreed to schedule dedicated sessions for community socialization.

In addition to engaging with village heads, the Hijau Manise Team identified stakeholders directly involved in greening activities. These stakeholders include: 1) UPT KPH Sumba Timur (Regional Forestry Management Unit of East Sumba); 2) KODIM 1601/Sumba Timur (East Sumba Military District Command); 3) Dinas Pertanian Sumba Timur (East Sumba Agriculture Department); 4) BMKG (Meteorology, Climatology, and Geophysics Agency); and 5) Karinga Dam Management. These stakeholders are key collaborators in supporting and ensuring the success of the greening initiatives under the Hijau Manise program.

Table 2. Stakeholder Identification related to The Hijau Manise Program

No.	Stakeholder	Findings
1	UPT KPH East Sumba	UPT KPH did not have a stock of greening plant seeds. However, it is willing to serve as a location for a greening plant nursery. PT MSM will provide seeds, polybags, fertilizers, and shade nets.
2	KODIM 1601/East Sumba	The Indonesian Army (TNI AD) runs the 'TNI Manunggal Membangun Desa' program in collaboration with local governments and the Ministry of Villages. One of its activities is tree planting (reforestation). Through coordination, the Hijau Manise program will collaborate with KODIM 1601/ST on planting activities in PT MSM and KODIM-supported areas, plant monitoring via Babinsa, and seed bank preparation.
3	East Sumba Agriculture Office	As of this period, the Agriculture Office does not have a greening program or fruit tree nursery. During coordination (January 2024), the office focused on food security activities through home gardens.
4	BMKG	BMKG provides special meteorological information services to support project activities, surveys, and commercial research for IDR 3,750,000.
5	Karinga Dam Management	Karinga Dam is an eco-membrane dam in Palanggai Village, covering 12 hectares. BPDAS manages it and will eventually become an asset of Palanggai Village. Its functions are 40% for agricultural irrigation and 60% for tourism. The dam had been stocked with 800 tilapia fish at the time of the visit. The location has adequate tourism infrastructure. Hijau Manise provided 20 Rain Trees (Trembesi) to be planted around the dam. This stakeholder holds potential for future collaboration, especially in preparing asset transfers to the village as a tourism object.

Source: Primary Data

3.6 Community-based planning and action

The planning for the Hijau Manise program was conducted participatively with local communities. Community members were gathered alongside key figures such as village heads and other stakeholders, including Babinsa, TEKAD groups, Dasawisma, and PKK.

During the first meeting, the Hijau Manise Team presented an overview of the program, including its objectives, the importance of tree planting, the types of plants to be cultivated, distribution mechanisms, and the program duration. Following the presentation, the community held discussions to address 1) types and quantities of trees to be planted; 2) recipients of the trees; 3) mechanisms for tree distribution and the appointment of Hijau Manise PICs in each village; 4) schedules and technical aspects of tree planting; 5) mechanisms for tree maintenance and periodic monitoring; 6) identification of potential challenges (e.g., water availability, maintenance, livestock, pests, and diseases).

The planning mechanisms varied across villages, reflecting local conditions: 1) some villages conducted focus group discussions (FGD) at the village hall; 2) others directly appointed farmer groups as implementers; and 3) in certain villages, tourism awareness groups and church congregations were involved. This diversity in planning approaches demonstrates the program's adaptability to field conditions.

Table 3. The planning mechanism implemented in each village

No.	Village Name	Planning Mechanism
1	Wanga Village, Umalulu District	Direct discussions with the Village Head, Secretary, and local government representatives. In 2022, they received 1,000 seedlings (20% survived). This year, they can only receive 35 trees.
2	Patawang Village, Umalulu District	Direct discussions with the Village Head, Tourism Awareness Group (Pokdarwis), and Church representatives. Planting will occur in agro-tourism, church land, and community yards.
3	Lambakara Village, Pahunga Lodu District	The Village Head appointed Dasawisma, followed by FGDs involving Dasawisma and village officials.
4	Palanggai Village, Pahunga Lodu District	The Village Head met with local officials and community representatives to determine the number, types, and locations of trees to be planted.
5	Tanaraing Village, Rindi District	FGD involves community representatives, local officials, key figures, and institutions. The planting team will carry out the Planting.
6	Matawai Maringu Village, Kahaungu Eti District	Formation of the Jaya Baru farmer group, which will plant trees in the area around four water springs and community yards.
7	Palakahembi Village, Pandawai District	The Village Head initially planned to meet with residents to organize tree planting in one area of village land and public facilities.

Source: Primary Data

From the first cycle of the PAR (Planning–Acting–Observing) approach, showcasing tailored interventions in selected villages based on their distinct problems and needs. Each village faced unique challenges, such as water scarcity, land degradation, income generation, and green education, addressed through participatory planning and collaboration with relevant stakeholders. The interventions ranged from tree planting in public areas, agroforestry development, and intercropping systems to green education initiatives, ensuring

a holistic approach to addressing environmental, economic, and social issues. These actions were designed to integrate local traditions, community priorities, and environmental sustainability into long-term development strategies.

For instance, in Wanga Village, challenges like limited water access and rocky terrain led to the construction of an artesian well and tree planting in the area, with support from local villagers and KODIM 1601. The belief that trees would enhance water availability fostered community participation. Similarly, in Patawang Village, interventions addressed unused land, poverty, and ownership disputes through agro-tourism development and cashew tree planting, involving stakeholders like Pokdarwis and local churches to create new income opportunities. In Lambakara Village, efforts centered on combating stunting and generating income by introducing intercropping systems and empowering women through Dasawisma groups, enabling them to participate actively in sustainable agricultural practices.

Table 4. The PAR Cycle 1- Tailored Intervention in Seven Villages

Village	Problems/ Needs	Intervention	Stakeholders	Values
Wanga	Water access, land burning for grazing fields, rocky land.	Artesian well, tree planting in the well area.	Villagers around the artesian well, KODIM 1601	The belief is that the tree will provide more water to the spring.
Patawang	Unused land, poverty, land ownership.	Agrotourism, cashew fields, tree planting, and an intercropping system are also included.	Pokdarwis Patawang, Patawang Church, KODIM 1601	Agrowisata as a new source of income for the community. Planting productive trees to establish land ownership and utilize the land for profitable ventures.
Lambakara	Unused land, stunting, income generating, land ownership.	Cashew field, tree planting, intercropping system, and women's involvement.	Dasawisma	Planting productive trees to establish land ownership and utilize the land for profitable ventures. Women (Dasawisma) can choose their crops and their economic/income-generating activities. Income generating from the intercropping system.
Palanggai	Drought, income-generating	Tree planting in public areas and yards.	Villagers	The belief that trees will catch more rain. Fruits are expensive; they want to provide food to their table.
Tanaraing	Unused land, income-generating	Tree planting in public areas and yards.	Tim Tanam, KODIM 1601	Utilize the land for profitable ventures.

Village	Problems/ Needs	Intervention	Stakeholders	Values
Matawai Maringu	Spring area, income-generating	Tree planting in spring area and yard.	Kelompok Tani, KODIM 1601	The belief is that the tree will provide more water to the spring (Marapu tradition).
Palakahembi	Green education, unused land	Tree planting in the schoolyard. Tree adoption program. Green education.	SMK Negeri 1 Pandawai	Children and adolescents' respect for trees has significantly diminished, indicating an urgent need for enhanced environmental education.

Source: Primary Data

The first cycle of the PAR (Planning–Acting–Observing) approach in selected villages focuses on addressing local challenges and embedding meaningful values. Each village faced distinct issues, such as water scarcity, land degradation, economic hardship, and declining environmental awareness. Tailored interventions were implemented to address these challenges in collaboration with community stakeholders, ensuring the solutions were context-specific and sustainable. These interventions were also designed to foster community engagement, empower local groups, and strengthen cultural values while achieving long-term ecological and economic benefits.

The interventions included various strategies, such as tree planting around water springs, agrotourism development, cashew farming, and green education programs in schools. Stakeholders like Pokdarwis, Dasawisma groups, local government, and educational institutions actively participated in the planning and implementation processes. These efforts targeted immediate needs, such as improving water access and generating income, and focused on promoting long-term sustainability, environmental stewardship, and community-driven development. The table below details each village's challenges, interventions, and outcomes.

Table 5. The PAR Cycle 2 – Values Evaluation and Intervention in Seven Villages

Village	Intervention-1	Values-1	Evaluation-1	Intervention-2
Wanga	Artesian well, tree planting in the well area.	The belief is that the tree will provide more water to the spring.	The community actively engages in the diligent care of the plants, leading to robust growth and vitality	Provide water access for households.

Village	Intervention-1	Values-1	Evaluation-1	Intervention-2
Patawang	Agrotourism, cashew field, tree planting, intercropping system.	Agrowisata as a new source of income for the community. Planting productive trees to establish land ownership and utilize the land for profitable ventures.	Pokdarwis have not been very active in plant maintenance, as they tend to wait for directives from the village head. Villagers need instant money.	Support Pokdarwis in plant maintenance and institutional management. Creating productive economic activities at agro-tourism sites, such as the production of handicrafts and demonstration plots for intercropping vegetables among fruit trees.
Lambakara	Cashew field, tree planting, intercropping system.	Planting productive trees to establish land ownership and utilize the land for profitable ventures. Income generated from the intercropping system. Women (Dasawisma) can choose their crops and their economic/income-generating activities.	The dasawisma actively cares for the plants. The prolonged drought has caused the wells to dry up, resulting in the death of many cashew trees.	Support Dasawisma institutional management. Creating productive economic activities at cashew fields, such as cashew products and demonstration plots for intercropping vegetables among cashew trees.
Palanggai	Tree planting in public areas and yards.	The belief that trees will catch more rain. Fruits are expensive; they want to provide food to their table.	The prolonged drought resulted in the death of some trees.	Replanting
Tanaraing	Tree planting in public areas and yards.	Utilize the land for profitable ventures.	All plants exhibit vigorous growth due to the diligent care provided by the community.	Education on plant maintenance and pest control.

Village	Intervention-1	Values-1	Evaluation-1	Intervention-2
Matawai Maringu	Tree planting in spring areas and yards.	The belief is that the tree will provide more water to the spring (Marapu tradition).	All plants exhibit vigorous growth due to the diligent care provided by the community.	Bamboo planting in the vicinity of water spring points.
Palakahembi	Tree planting in the schoolyard. Tree adoption program. Green education.	The respect for trees has significantly diminished among children and adolescents, indicating an urgent need for enhanced environmental education.	The vocational school (SMK) implements a plant care system by class, directly monitored by the class teacher. A drip irrigation system is utilized to ensure the plants remain healthy. Individual fencing is established around each plant to protect them from livestock.	Tree adoption program by parents. Environmental education as part of SMK's Merdeka Belajar curriculum

Source: Primary data

3.7 Reflecting on value formation and community engagement for the Hijau Manise Program

The importance of four underlying values in community planning that serve as the foundation for effective and inclusive development strategies [10]. These values—prosperity, liberty, social justice, and sustainability—highlight the essential principles that guide planning processes to create equitable, thriving and sustainable communities. By integrating these values, community planning moves beyond addressing immediate needs to fostering long-term resilience and shared growth.

Each value reflects a specific dimension of community planning. Prosperity focuses on economic empowerment and the creation of productive skills and enterprises. Liberty underscores the importance of freedom of choice, particularly in decision-making and resource management. Social justice ensures equitable participation and benefits across all societal groups, prioritizing those most disadvantaged. Lastly, sustainability advocates for preserving natural resources and instilling environmental values across generations.

As in the PAR cycle, where planning, acting, observing, and reflecting are continuous processes, the underlying values are crucial for achieving the sustainability of the Hijau Manise greening program. The table below details these values and their role in shaping effective community planning.

Table 6. Values Formation for Hijau Manise Program

Values Formation	
The value of prosperity	• Communities foster the creation and transmission of productive skills by creating conditions for beneficial exchange of goods and products. • Communities make possible the combination of individual energies and skills required in coordinated projects and production. • Communities support the growth that promotes the collaboration needed to produce innovation to build new enterprises. • Communities act as seedbeds of technical innovation, incubating invention and substitution and making possible collaboration and collective investment.
The value of liberty	• Freedom of speech. • Freedom to choose trees/plants/crops. • Women's involvement in community decision-making.
The value of social justice	• Collaborative and exploratory participation in reaching decisions. • Distribution of economic irregularities (differences in levels of benefit) to confer the most benefit to the currently least advantaged (giving most to those who have the least).
The value of sustainability	• Trees must be preserved to address climate change and promote a sustainable planet. • Preserving the noble values of environmental conservation from an early age.

The table below illustrates how various values are reflected in the interventions and outcomes across different villages involved in the Hijau Manise program. Each village demonstrates a unique alignment with specific values—sustainability, prosperity, social justice, and liberty—that underpin its greening efforts and community initiatives. These values guide decision-making and shape the approaches taken to address local challenges, ensuring that the program is effective, culturally, and socially meaningful.

Table 7. Values Identifications and Categories for Each Village

Village	**Values**	**Values Category**
Wanga	The belief that the tree will provide more water to the spring.	The value of sustainability
Patawang	Agrowisata as a new source of income for the community Planting productive trees to establish land ownership and utilize the land for profitable ventures.	The value of prosperity The value of social justice
Lambakara	Planting productive trees to establish land ownership and utilize the land for profitable ventures. Income generated from intercropping system	The value of prosperity The value of social justice The value of liberty
Palanggai	The belief that trees will catch more rain Fruits are expensive; they want to provide food to their table.	The value of prosperity

Village	Values	Values Category
Tanaraing	Utilize the land for profitable ventures.	The value of prosperity The value of social justice
Matawai Maringu	The belief that the tree will provide more water to the spring (Marapu tradition).	The value of sustainability
Palakahembi	Children and adolescents' respect for trees has significantly diminished, indicating an urgent need for enhanced environmental education.	The value of sustainability.

The reflection phase in the PAR cycle is crucial for evaluating the effectiveness of interventions and making iterative improvements. Table 7 presents how each village's engagement in the greening program reflects underlying community values and identifies areas for improvement. The reflecting stage involved community meetings, participatory evaluations, and discussions on the outcomes of tree planting efforts. The reflection process revealed distinct challenges and adaptations across different villages:

1. Wanga recognized the need for improved water conservation strategies to prevent tree loss due to drought.
2. Patawang identified gaps in community responsibility and introduced additional livelihood programs to maintain engagement.
3. Lambakara recognized the need for create income generating from intercropping system.
4. Palanggai prioritized fruit-bearing trees as an economic and food security strategy.
5. Tanaraing introduced pest control education to ensure the survival of newly planted trees.
6. Matawai Maringu emphasized the importance of water management in sacred spring areas, leading to bamboo planting to enhance water retention.
7. Palakahembi found that youth engagement in tree planting was low, prompting the introduction of a tree adoption program in schools.

The reflection process reinforced the importance of aligning interventions with community values and priorities:

1. In Patawang and Lambakara, prosperity and social justice emerged as dominant factors, highlighting the role of economic incentives in sustaining participation.
2. In Matawai Maringu and Palakahembi, sustainability was emphasized, leading to stronger environmental education and conservation efforts.
3. Liberty played a role in ensuring community-led decision-making, particularly in tree selection and maintenance strategies.

These reflections directly shaped subsequent planning cycles, enabling the Hijau Manise program to adjust interventions based on real-time community feedback. For example, in response to water conservation challenges, Lambakara and Wanga incorporated additional irrigation strategies, while Palakahembi's emphasis on youth involvement led to the introduction of tree adoption programs in schools. The iterative nature of the PAR approach ensures that strategies remain community-driven, adaptable, and sustainable.

4 Conclusion

The "Hijau Manise" Program highlights the importance of embedding core values into community-driven greening initiatives to ensure sustainability and long-term success. Using a Participatory Action Research (PAR) approach, the program identifies four fundamental values—prosperity, liberty, social justice, and sustainability—as essential pillars for

fostering a meaningful connection between the community and the greening efforts. These values guide the program's planning, implementation, and evaluation, ensuring that the initiatives address environmental and socio-economic challenges and resonate with the local communities' cultural and social priorities.

Each value plays a distinct role in shaping the program's outcomes. Prosperity emphasizes economic empowerment through activities like planting productive trees and developing agro-tourism, creating income generation and innovation opportunities. Liberty ensures that communities can choose tree species and contribute to decision-making, promoting inclusivity and gender equality. Social justice focuses on equitable participation and resource distribution, ensuring the program's benefits reach the most disadvantaged groups. Finally, sustainability underscores the importance of preserving natural and cultural resources for future generations, aligning with local traditions like the Marapu belief system.

The research found that Prosperity and Social Justice are the primary drivers of success in community-based greening programs in East Sumba, emphasizing the importance of economic value and equitable benefit distribution. By incorporating these values into program design, greening initiatives can ensure community ownership, long-term sustainability, and ongoing care for planted trees. These findings also provide a scalable model for other semi-arid regions facing similar environmental and social challenges, demonstrating the importance of embedding local values in sustainable development initiatives.

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