ANNUAL REPORT

MAZINGIRA ALLIANCE FOR COMMUNITY AND CONSERVATION

(MACCO)

YEAR 2025

Mimi ni kitu kimoja na mazingira yangu, na nisipoyahifadhi, sijihifadhi mwenyewe.
I am one with my environment, and if I do not protect it, I do not protect myself.

MACCO
MAZINGIRA ALLIANCE FOR COMMUNITY AND CONSERVATION

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Inside front cover image: *James, agroforestry farmer with his new born daughter* © Claudia Capri

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MAZINGIRA ALLIANCE FOR COMMUNITY AND CONSERVATION (MACCO) promotes international collaboration for sustainable development, with a strong focus on environmental conservation and the protection of biodiversity and ecosystem services.

Through a combination of research, ecological monitoring, education, and community-driven initiatives, we support and empower local communities in safeguarding fragile ecosystems and mitigating human-induced pressures on the natural environment.

UDZUNGWA MOUNTAINS

BACKGROUND

"Mazingira" the Swahili word for environment, reflects our core mission and deep connection to Tanzania's nature.

Our primary area of intervention is the Udzungwa Mountains in south-central Tanzania, part of the globally significant Eastern Arc Mountains – one of the world's leading biodiversity hotspots. The Udzungwas contain some of the most ecologically important rainforest blocks in Africa.

Alongside ancient montane rainforests, the landscape also comprises lowland forests, woodlands, and grasslands, forming a mosaic of habitats that supports exceptional biodiversity. The area hosts over 400 bird species, 120 mammals, 2,500 plant species, and countless invertebrates, many of which are still awaiting scientific description.

SIGNIFICANCE OF THE REGION

The Udzungwa Mountains remain one of Tanzania's most critical landscapes for both people and nature. They sustain local livelihoods, safeguard exceptional biodiversity, help regulate regional climate patterns, and supply water that is indispensable for agriculture and hydropower generation. Nearly half (46%) of Tanzania's endemic vertebrate species occur in this region, including 20 species found nowhere else on Earth. The mountain forests feed major river systems that support hydroelectric facilities responsible for approximately 23% of the country's electricity production. These forests also deliver essential ecosystem services to surrounding communities, which rely heavily on agriculture for both their well-being and economic resilience.

KEY CHALLENGES

The exceptional ecosystems of the Udzungwa Mountains continue to face increasing pressure from both environmental and human-driven threats. The most significant challenges include:

- deforestation and habitat degradation, driven by agricultural expansion, illegal logging, and recurrent fires
- illegal hunting and plant collection for both subsistence and commercial trade
- encroachment and intensifying pressure on forest buffer zones
- limited management capacity and weak institutional coordination, which hinder effective conservation measures
- increasing impacts of climate change, affecting rainfall patterns, forest health, and species distributions
- rising food insecurity, which amplifies dependence on forest and natural resources
- growing reliance on ecosystem resources as local populations expand and economic needs increase

POSSIBLE SOLUTIONS

In response to the increasing pressures on the Udzungwa Mountains, and thanks to the generous support of private foundations together with regular institutional funding, we propose an integrated set of actions aimed at strengthening conservation efforts, promoting sustainable development, and empowering local communities:

- enhancing governance through capacity building and inclusive community participation
- strengthening local institutions to enhance natural resource management
- promoting integrated landscape-level planning that aligns conservation objectives with local development
- supporting biodiversity monitoring and threat mitigation in collaboration with protected area authorities
- expanding environmental education—especially for youth—to cultivate future environmental stewardship
- fostering gender equality by promoting women's leadership in conservation
- encouraging the adoption and local production of energy-efficient technologies to curb deforestation and habitat loss
- promoting sustainable livelihood opportunities to reduce dependence on forest resources
- advancing the Udzungwa Landscape Strategy (ULS), integrating community and protected-area efforts for effective biodiversity conservation

MACCO: OUR ROOTS

MACCO (formerly AMNGO) was renamed in 2025, following AMNGO's scale-up and incorporation of the Udzungwa Ecological Monitoring Centre (UEMC) into its organization. In doing so, MACCO brought together the two core components of the systemic programme initiated by MUSE and Associazione Mazingira in the Udzungwa Mountains in 2011: research and monitoring on the one hand, and community-based activities on the other—both aimed at conserving the Udzungwa forests.

MACCO traces its roots to the early 2000s, when growing international interest in the Udzungwa Mountains' biodiversity and TANAPA's goal to establish ecological monitoring centres led MUSE to launch a long-term research initiative, culminating in the creation of the Udzungwa Ecological Monitoring Centre (UEMC) in 2006. In 2010, in Italy, MUSE collaborators founded Associazione Mazingira ODV (AMODV), with the aim of implementing community-based conservation programs, in the Kilombero Valley, integrating people and nature for sustainable development. Over the years, these programs led to the establishment of a local NGO, Associazione Mazingira NGO (AMNGO), in 2019.

Following AMNGO's 2022 scale-up and incorporation of UEMC, the organization was renamed as MACCO in 2025.

Udzungwa Mountains © Michele Menegon

MACCO Community and Livelihoods staff © Silvia Ricci

Gate of A. Mazingira NGO office in Mang'ula B © Silvia Ricci

OUR HISTORY IN BRIEF

2006

- UEMC inauguration under MUSE and TANAPA coordination
- UEMC expands Primate Monitoring Programme initiated in the 1990s

2010

- Construction of the UEMC hostel
- First research-education programme by Pennsylvania State University
- Associazione MAZINGIRA ODV (AMODV) is founded in Italy

2011

- First international summer schools

2012

- First multi-year programme on community and livelihoods by AMODV

2013

- First eco-tours

2015

- Fondazione Foresta Futura (FFF) launches the agroforestry programme

2017

- The Natural History Museum of Denmark (NHMD) joined UEMC coordination
- Uzungwa Scarp upgraded to Nature Reserve (Primate Monitoring Programme)

2018

- Solar energy microcredit project launched (partners: TAREA and Microfinanza e Sviluppo)
- VIC Inauguration supported by MUSE and AVJCF

2019

- Associazione Mazingira NGO (AMNGO) is registered as a local NGO

2021

- AVJCF funds 5-year conservation program

2022

- AMNGO scales up incorporating UEMC

2024

- AMNGO assigned to implement ULS activities under 3 Strategic Objectives

2025 AMNGO is registered as MACCO

OUR FUNDERS AND IMPLEMENTING PARTNERS

OUR FUNDERS IN 2025

Aage V. Jensen Charity Foundation (Denmark), *Wild Planet Trust* (UK), *Fondazione Foresta Futura* (Italy), *Pennsylvania State University* (USA), *Hempel Foundation* (Denmark), *Hamer Foundation* (USA), *Viaggi e Miraggi* (Italy), *African Wildlife Foundation* (USA), *Natural History Museum of Denmark* (Denmark), *MUSE - Museo delle Scienze* (Italy), *Bristol Zoo* (UK)

OUR IMPLEMENTING PARTNERS IN 2025

Tanzania National Park (Tanzania), *MUSE - Museo delle Scienze* (Italy), *Natural History Museum of Denmark, University of Copenhagen* (Denmark), *University of Florence* (Italy), *Tanzania Forest Service Agency* (Tanzania), *Kilolo District Authority* (Tanzania), *Kilosa District Authority* (Tanzania), *Kilombero District Authority* (Tanzania), *Mlimba District Authority* (Tanzania), *Pennsylvania State University* (USA), *Reforest Africa* (Tanzania), *Bristol Zoo* (UK), *Wild Planet Trust* (UK), *Southern Tanzania Elephant Program* (Tanzania), *BIOSPHAERA* (Italy), *Viaggi e Miraggi* (Italy), *African Wildlife Foundation* (USA)

2025 IN NUMBERS

RESEARCH AND MONITORING

ECOLOGICAL MONITORING

10,487
km walked for primate census

111
sites for camera trapping

4,306
camera trapping **days**

44,205
camera trap **images**

2,848
trapping **days** for arthropods

1,386
man/day
of field work

7
scientific publications
authored by us

RESEARCH FACILITIES

386
visitors

298
Tanzanian

88
non-Tanzanian

35
researchers

48
students (university and secondary)

303
general visitors
(tourists and govt)

EMPOWERMENT

3
technical advisory **workshops**

1
training for villagers

4
staff development **trainings**

62
trainees reached

HIGHER EDUCATION

1
summer school

22
students involved

8
international **lecturers** involved

COMMUNITY AND LIVELIHOODS

ENVIRONMENTAL EDUCATION

28
schools and environmental clubs involved in EE

3
districts involved

3,882
students reached (2035 F and 1847 M)

79%
students pass the final EE exam

18
enviromental clubs engaged and revitalized

20
environmental teachers trained

1,500
students involved in environmental practices

8
school lavatories maintained

AGROFORESTRY AND GREENING

253
farmers trained

13
villages in 3 districts involved

10
tree nurseries established

138,975
seedlings produced

310
farmers provided with seedlings

88%
seedling survival rate

140
agroforestry farms established

1
agroforestry exhibition event with 214 (29% women) participants

SUSTAINABLE ENERGY-EFFICIENT TECHNOLOGIES

99
stove makers trained

26
villages in 4 districts

60
stove makers trained on movable stoves in 13 villages

4,617
improved stoves constructed

22,713
household members benefited

ECO-TOURISM

39
tourists visited the Udzungwas (3 trips)

3,800
euros raised through donations

COMMUNITY SENSITIZATION

4
districts reached (Kilombero, Kilolo, Kilosa, Mlimba)

33
villages engaged in conservation activities

2,797
community members involved

27
MACCO staff members capacitated on various topics activities

INCOME-GENERATING ACTIVITIES

1
alternative charcoal factory constructed

31,650
seedlings sold in Mlimba District

4,005,700
TSH earned from seedlings' sale

Uduzngw

ECOLOGICAL MONITORING

implement long-term biodiversity assessments and monitoring

RESEARCH FACILITIES

facilitate individual researchers, PhD students and agencies working in the area to promote research and conservation efforts

a red colobus © Massimo D'Ambrosi

RESEARCH AND MONITORING

EMPOWERMENT

provide technical advisory and training to local staff and communities from protected areas and conservation agencies

HIGHER EDUCATION

boost the hosting and facilitation of field-based training of students, such as summer schools and studying abroad visits

Setting camera traps © Francesco Rovero

ECOLOGICAL MONITORING

WHY MONITORING

- Assess biodiversity status and document newly identified species
- Detect and quantify significant ecological changes over timeIdentify drivers of change
- Identify the key drivers influencing these changes
- Anticipate future trends and provide guidance for conservation management

WHAT DO WE MONITOR

- Invertebrates
- Non-human primates
- Terrestrial mammals
- Vegetation
- Human disturbance

INVERTEBRATE MONITORING PROGRAMME

For more than fifty years, the Natural History Museum of Denmark — a founding partner and co-manager of UEMC — has been at the fore-front of biodiversity research in the Eastern Arc Mountains. Much of this work has centred on the Udzungwa range, where decades of field surveys have brought to light a remarkable concentration of endemic species, including amphibians and birds. These discoveries played a decisive role in recognising the global conservation importance of the area and contributed to its designation as a National Park in 1992.

A major milestone in documenting Udzungwa's invertebrate fauna came in 2014, when the CO-BRA protocol was applied across multiple hab-itats. The survey revealed an exceptional spider community, with 631 documented species — an

astonishing 85% previously unknown to science — and more than 60 endemic millipedes identified and described over the past decade. The COBRA data enabled one of the first detailed analyses of within-habitat patterns in Udzungwa's spider assemblages. Results showed that beta diversity increases with altitude, distance-decay relationships are more pronounced at higher elevations, and high-elevation species tend to be smaller and exhibit lower ballooning frequency. These characteristics highlight the conservation relevance of high-altitude habitats, where even minor habitat restoration or connectivity measures can safeguard countless small-range or habitat-restricted endemic species.

Since 2012, the Eastern Arc Biodiversity Programme has expanded this body of work by focusing specifically on the region's poorly studied invertebrate communities. The programme combines biodiversity inventories, the optimisation of low-cost sampling techniques, and analyses of species turnover along ecological gradients. Early surveys, particularly those targeting spiders, demonstrated clear differences in species composition among protected areas. Building on these findings, long-term monitoring of flying insects was initiated in late 2022 using Malaise traps, with the intention of incorporating ground-dwelling taxa through pitfall trapping.

Invertebrates, thanks to their short generation times and restricted ranges, act as highly responsive indicators of environmental change. The monitoring programme therefore complements vertebrate surveys and serves as an early-warning system for shifts in ecosystem health. During 2025, monitoring efforts expanded substantially across three protected areas. In Mwanihana Forest (UMNP), two long-standing sampling sites continued to operate at 1,190 m and 1,532 m, each equipped with two Malaise traps running throughout the year. In the Uzungwa Scarp Nature Forest Reserve, two additional sites at 1,220 m and 1,630 m were maintained for the first six months of the year. The most significant development was the establishment of two new monitoring sites in Undundulu, within the Kilombero Nature Forest Reserve (KNFR), at 1,803 m and 2,100 m. In these high-altitude locations, each site was equipped not only with two Malaise traps but also with 48 pitfall traps, marking the first year in which ground-dwelling invertebrates were fully incorporated into the monitoring scheme. Trapping in KNFR was carried out during the second half of the year. The installation and maintenance of a total of 96 pitfall traps required a major increase in field labour, particularly due to the need for regular emptying and refilling.

All traps — with the exception of those newly installed in KNFR — functioned continuously throughout their operational period, aside from occasional interruptions caused by storms, wildlife interactions, or falling branches. Traps were serviced every two weeks.

In 2025, Malaise trapping amounted to:

- 712 trap days in USNFR (6 months × 4 traps),
- 1,424 trap days in UMNP (12 months × 4 traps),
- 712 trap days in KNFR (6 months × 4 traps),

for a total of 2,848 trap days across the three protected areas.

Inserting pitfall traps into the ground
© Richard Lowassari

Pitfall trapping contributed an additional 17,088 trap days in KNFR (96 traps × 6 months), representing a significant new dataset for the programme.

Fieldwork requirements varied among reserves: two staff members worked two days per month in Mwanihana (48 person-days/year), four staff worked six days per month in Uzungwa Scarp (144 person-days over six months), and three staff worked eight days per month in the remote Kilombero reserve (144 person-days over six months). Monitoring in KNFR will continue for another six months in 2026, followed by six months of fieldwork either in USCFR or UMNP, ensuring a robust and comparable long-term dataset for at least two protected areas.

PLANS FOR 2026

- Continue the monitoring in Mwanihana Forest, Udzungwa Mountain National Park or Uzungwa Scarp Nature Forest reserve, depending on funding availability
- Continue monitoring in the Kilombero Nature Forest Reserve with both Malaise traps and pitfall traps, if funding allow us to run three monitoring sites

PUBLICATIONS

Enghoff, H., Ngute, A. S. K., Mnendendo, H. R., Kivambe, E. E., Mhagawale, W., Malanda, R. C., Mpoto, A., & Marshall, A. R. (2025). A mountain of millipedes XII. The Chelodesmidae of the Udzungwa Mountains, Tanzania (Diplopoda, Polydesmida). *European Journal of Taxonomy*, 997, 210-255.

Malumbres-Olarte, J., Crespo, L., Cardoso, P., Laizzer, R. L., Mwakisoma, A., Rigal, F., Szűts, T., Pape, T., & Scharff, N. (2025). Within-habitat β diversity increases with elevation in tropical forest spider assemblages. *African Journal of Ecology*, 63(7), e70111.

PRIMATE MONITORING PROGRAMME

The Primate Monitoring Programme is the longest-standing ecological monitoring effort in the Udzungwa Mountains, with uninterrupted activity spanning more than twenty years. The programme follows a standardized protocol consisting of systematic surveys conducted along four permanent transects—each measuring between 3.6 and 4 km—located within both Mwanihana and the Uzungwa Scarp Nature Forest Reserve (USNFR). Each month, a trained observer accompanied by an assistant completes two surveys in Mwanihana and one in USNFR.

During these slow-paced transect walks, all primate encounters are carefully documented. By 2025, the programme had accumulated 144 transect walks done in the two forests, for a total 2,621 walks since the beginning of the programme. Five primate species are consistently included in the monitoring scheme:

- Udzungwa red colobus (*Procolobus gordonorum, endangered and endemic*)
- Peters' Angola colobus (*Colobus angolensis*)
- Tanzania Sykes' monkey (*Cercopithecus mitis monoides*)
- Sanje mangabey (*Cercocebus sanjei, endangered and endemic*)
- Yellow baboon (*Papio cynocephalus*)

Analyses of data up to 2020, summarized in the 2023 paper by Barelli and colleagues, indicated that primate populations in Mwanihana have remained largely stable, while those in USNFR have declined sharply, particularly the two colobus species, now at critically low densities. Sykes' monkeys show signs of recovery, and early trends suggest colobus numbers may be stabilizing. Data screening for the ensuing years including for 2025 confirms the trend published in 2023.

These contrasting patterns likely reflect historically higher human pressures in USNFR and slow

Black and white colobus © Massimo D'Ambrosi

capacity of these primates to recover from near local extinction. However, conservation measures implemented after its designation as a Nature Reserve in 2017, including reduced hunting, appear to be producing initial improvements, which are especially notable for the opportunistic and ecologically more flexible Sykes's monkey.

This long-term monitoring highlights the value of simple, consistent protocols in tracking population trends and the importance of maintaining—and reinforcing—habitat protection. A central aspect of MACCO's approach is linking monitoring with enforcement: transect and camera-trap data are shared almost in real time with the Uzungwa Scarp Protection Programme (and hence since 2025 with the Udzungwa Landscape Strategy Strategic Objective allowing TFS to target patrols and respond quickly to illegal activity.

Complementary research on primate health has shown gut microbiota to be a sensitive indicator. Microbial communities vary across species and populations in different environments, reflecting habitat-specific pressures, and differ among individuals within the same population due to diet, sex, movement, social dynamics, and local disturbances.

PLANS FOR 2026

- Continue to monitor non-human primates using ghe same protocol
- Continue data screening and analyses

PUBLICATIONS

Barelli C, Jones T, Laizzer R, Shinyambala S, Mndeme A & Rovero F (in press). Searching for the forest ghosts: group counts and polyspecific associations of the Endangered Rungwecebus kipunji in the Udzungwa Mountains, Tanzania. *Primates*.

De Jong YA, Cunneyworth P, Butynski TM, Maisels F, Hart JA & Rovero F (2025). Colobus angolensis (amended version of 2020 assessment). The IUCN Red List of Threatened Species 2025: e.T5142A274973854. 854. https://dx.doi.org/10.2305/IUCN.UK.2025-1.RLTS.T5142A274973854.en

CAMERA TRAPPING TO MONITOR GROUND-DWELLING MAMMALS

A second key monitoring initiative, complementary to the primate programme, focuses on ground-dwelling mammals through systematic camera-trapping. This effort was launched in 2009, when UEMC became the first African site of the Tropical Ecology, Assessment, and Monitoring (TEAM) Network, a pan-tropical programme designed to track long-term biodiversity changes across species, communities, and ecosystems, and to provide an early warning system for tropical forests worldwide. The original TEAM protocols emphasized both terrestrial

vertebrates and vegetation. Initially coordinated and funded by Conservation International, TEAM shifted to a decentralized, voluntary network in 2017, and since then UEMC has continued to secure the necessary resources to maintain ongoing monitoring.

TEAM's original sampling effort targeted Mwanihana forest within UMNP, with sampling that consisted of installing and running camera-traps at 60 sites across the forest for 30 days in the dry season (July-November). Remarkably, sampling has been conducted consistently from 2009 till 2024, hence completing an unparalleled sequence of 16 years. Indeed to our knowledge this is among the few areas on earth where systematic camera trap- ping has been conducted for such a long period.

Mirroring the primate monitoring, in 2016 the sampling was extended to USNFR, where 60 sites were also established and since then monitored annually, including in 2025, when the sampling also took place during July to November, with the usual system of sampling 20 arrays sequentially, each with 20 camera-trap sites. In addition, in 2025 instead of repeating sampling in Mwanihana, where data showed general stability in wildlife trends, we decided to begin a new sampling in the Kilombero Nature Reserve (KNR), where biodiversity work has been generally lacking. We sampled two main forests, again from July till November, specifically Nymbanitu and Ndundulu. Sampling accumulated 4,306 camera trapping days, and over 44,000 images were collected from the two surveys.

Similarly to the differences found from the primate monitoring, results from initial analyses have already revealed how the community of mammals in Uzungwa Scarp continue to show a lower number of species and lower population abundance relative to Mwanihana in the National Park. While data from KNR have not been statistically analysed at the time of writing this report, initial assessment from the images obtained has shown that wildlife populations in Ndundulu are in better shape than in Nyumbanitu. Indeed it is documented that the latter forest suffers from greater encroachment than Ndundulu which is contiguous to UMNP and hence under a better protection regime.

Among the 2025 publications arising from this monitoring programme, one stands out for its scope and relevance. Using comparable data from 38 tropical sites, including the two in the Udzungwa Mountains, the study examined how human disturbance across the landscape affects wildlife within monitored areas. Findings confirmed that anthropogenic pressures negatively impact species, causing declines, while the persistence of remaining populations is influenced by forest extent. These results reinforce the significance of MACCO and partners' approach to landscape-level conservation, as exemplified by the Udzungwa Landscape Strategy (see pp. 40–41).

PLANS FOR 2026

- Continue the camera-trap monitoring the same two forests as done in 2025
- Complete an analysis of trends from data from both Mwanihana and USNFR

PUBLICATIONS

Greco I, Beaudrot L, Sutherland C, Tenan S, Hsieh C, Gorczynski D, ... & Rovero F (2025). Landscape-level human disturbance results in loss and contraction of mammalian populations in tropical forests. *PLoS biology*, 23(2), e3002976.

New UEMC research laboratory © Vedasto Vahaye

RESEARCH FACILITIES

In 2025, the Research and Monitoring Department (under which UEMC operates) further strengthened its role as a key platform for research and capacity-building, continuing to provide accommodation and logistical services to a broad spectrum of users. These included national and international researchers, students involved in independently organized or institutional training programmes—such as summer schools and field courses—as well as conservation initiatives run by external organizations. The centre's facilities were also occasionally accessed by tourists visiting the area.

Over the year, 386 individuals made use of the MACCO's services. Of these, 77.9% (301 visitors) originated from African countries, with 298 from Tanzania and 3 from elsewhere on the continent, while the remaining 22.1% consisted of visitors from outside Africa. Among the 85 non-African guests, 74.1% (63 individuals) were European, representing Italy, Denmark, and the United Kingdom. The rest came from across the world: 15.3% from the Americas, 8.2% from Asia, and 2.4% from Australia.

Of all visitors, 276 stayed overnight, while the remainder used the centre as day visitors. The user base was diverse, comprising 35 researchers, 48 students, 29 government representatives, 2 journalists, and 272 members of the general public. In terms of length of stay, 329 guests were hosted for short visits, whereas 57 had extended stays.

In August 2025, MACCO inaugurated its new laboratory facility, opened by a representative of the Conservation Commissioner of TANAPA, Dr. Bakari Jesse Mnaya. The structure includes office space, a lecture and training room, and dedicated areas for sorting and analysing biological samples, together with separate sanitation facilities. The laboratory addresses a longstanding need identified by the Research and Monitoring Department, TANAPA, and partner organizations since 2021, as research activities in the Udzungwa Mountains became increasingly complex. Previously, field-collected samples had to be processed without a dedicated workspace. The new facility now provides purpose-built rooms for preparing, identifying, and storing biological and en-

vironmental materials, as well as housing specialised equipment requiring controlled conditions. Beyond the infrastructure upgrade, the laboratory plays a key role in enabling systematic ecological monitoring, biodiversity assessments, and long-term research essential for evidence-based conservation management. It also improves the working environment for scientists, strengthens training and supervision of Tanzanian and international students, and enhances collaboration among TANAPA, universities, research institutions, and conservation partners. The total investment amounted to approximately TZS 136 million (around EUR 50,000). The project was funded by the Aage V. Jensen Charity Foundation, with facilitation and technical support from the Natural History Museum of Denmark. Representatives of the foundation's Board of Directors attended the opening ceremony, along with staff from MACCO MUSE, TANAPA, and the NHMD.

Planned and constructed between 2023 and 2025, the facility is now fully operational and significantly strengthens MACCO's capacity to support conservation research and training across the Udzungwa landscape.

WHICH FACILITIES WE HAVE

UEMC holds the following facilities available to researchers and agencies:

- a large (150 m^2) seminar room (accommodating over 50 people)
- three researchers' houses, each with two double, self-contained rooms
- a large dormitory block with four rooms (hosting up to 24 people)
- a dining hall with annexed kitchen and store, capable to serve up to 30 people
- a new laboratory, inaugurated in September, for sorting, identifying, processing, and storing biological and environmental samples

PLANS FOR 2026

- Equipped the new laboratory to ensure full operational functionality
- Continue to promote the facilities
- Improve the engagement with local and international stakeholders to showcase the research facilities

Seminar room of the new UEMC laboratory © Vedasto Vahaye

Moments of the UEMC new laboratory inauguration © Vedasto Vahaye

Camera trap training session © Francesco Rovero

EMPOWERMENT

In 2025, MACCO continued to strengthen its collaboration with the Ecology Department of the UMNP. The partnership focused on the regular exchange of ecological monitoring data and on technical support aimed at improving the structure and coordination of park-led monitoring activities. MACCO also contributed to staff development by providing practical field support and organizing additional training opportunities linked to ongoing monitoring programmes.

As part of its continued commitment to strengthening staff capacity, MACCO worked together with key partners — including STEP, Reforest Africa, TANAPA, TFS and AWF — to deliver eight training events held at our facilities, including:

- **Community-based capacity building:**

  conducted for village committee members, involving 22 participants. The training aimed to empower them with the knowledge and skills required to effectively monitor and oversee the implementation of conservation projects within their respective villages.

- **Technical collaboration:**

  PA effectiveness workshop: a joint training with STEP on PA effectiveness with aim to provide capacity development support, thought leadership, and technical assistance to improve conservation outcomes through good adaptive management practice to help them design, manage, monitor, and learn from their work. The workshop was facilitated by Foundations of Success (FOS) which is a US non-profit organization and delivered to 14 attendees from various organizations (i.e. TFS, TANAPA, MACCO, STEP and MUSE).

  Specialized ranger training: a two-day intensive course led by STEP was conducted to enhance rangers' knowledge of local biodiversity and strengthen their skills in effective patrol planning and management.

***Botanical gardens and ecological restoration*:** a two-day training session conducted by Reforest Africa for community members and VGS on the importance of botanical gardens and ecological restoration within wildlife corridors. The aim of the training was to increase community awareness on biodiversity conservation, promote the establishment and proper management of botanical gardens, and strengthen community participation in restoring and protecting ecological corridors for sustainable environmental management.

- **Staff development trainings:**

  One two-day training was delivered on *entrepreneurship, advertisement, marketing and promotion of goods* to 36 participants. The aim of the training was to enhance staff capacity in identifying business opportunities, developing competitive marketing strategies, increasing product visibility, and ultimately improving income generation and organizational sustainability.

  One five-day training was delivered on *grant proposal and report writing* to enhance effectiveness and overall performance in their roles. A total of seven (7) staff members attended the session.

  MACCO staff was also trained on *how to effectively understand and implement the Operations Manual* in their day-to-day activities. A total of thirty-six (36) staff members participated in the training, which was conducted over two separate days. The aim of the training was to strengthen staff understanding of organizational policies, procedures, and standards outlined in the Operations Manual, ensuring consistency, accountability, and improved efficiency in service delivery across all departments.

  Additionally, MACCO staff received one-day training on *pollution, report writing, and presentation preparation*. A total of thirty-six (36) staff members were reached through this training. The aim of the training was to enhance staff awareness and understanding of environmental pollution issues, while strengthening their skills in report writing and effective presentation preparation to improve communication, documentation, and overall organizational performance.

  Moreover, the Research and Monitoring Department of MACCO continued to support key ecological monitoring activities within the park. In 2025, this included the provision of transport and field assistance for large-mammal transect surveys, as well as an annual financial contribution of approximately TZS 1.2 million to facilitate their implementation. These contributions complemented the technical guidance regularly provided to TANAPA in the planning and execution of monitoring activities.

WHAT WE PROVIDE

- Organization of training workshops
- Logistical support for training workshops and technical advisory services
- Promote higher education trainings to TANAPA and MACCO staff

PLANS FOR 2026

- Continue facilitating training courses and workshops
- Support higher education studies on wildlife topics
- Implement adult education and awareness-raising on conservation

Students of the 2025 summer school at camp during a lecture © Nikolaj Scharff

HIGHER EDUCATION

In continuity with the objective of strengthening local human capital, this year's activities also included targeted support for access to higher education pathways at both national and international levels. Building on previous efforts, assistance was provided to help local collaborators progress in their university studies and to access European-funded master's programmes in sustainable forest and nature management. These opportunities continue to enhance local expertise and contribute to the development of long-term professional capacity in conservation and environmental management.

SUMMER SCHOOLS & STUDY ABROAD PROGRAMMES

The student hostel adjacent to the research facilities has continued to provide the necessary infrastructure for hosting recurring international academic activities. Since 2017, one of the centre's flagship initiatives has been the annual field course in East African ecology and evolution organised by the Natural History Museum of Denmark. This programme targets undergraduate students from both Europe and Tanzania and regularly involves participants from the University of Copenhagen, the University of Dar es Salaam, Sokoine University of Agriculture, and Mweka Wildlife College. Across seven editions, a total of 154 students have taken part in this immersive training experience.

The 2025 edition brought together 22 students—16 from Denmark and 6 from Tanzania—who were taught by a team of 8 lecturers representing partner institutions in both regions. The course introduces participants to the ecology of East African rainforest and savanna systems, combining theoretical components with extensive fieldwork on biodiversity monitoring, species identification and conservation challenges. Through practical exercises, students gain direct

experience with tropical field methods and learn about the roles and interactions of major plant and animal groups native to the region.

In 2025, particular emphasis was placed on mammals, invertebrates, and plants. Among the hands-on activities, students revisited an exercise first introduced in 2024 involving the defensive secretions of cylindrical millipedes, which unexpectedly attract several blow fly species — a phenomenon not previously reported in scientific literature. The activity was used both to demonstrate this unusual interaction and to guide students through the process of generating suitable data for scientific documentation. During the 2025 course, the exercise was repeated using different sites and times of day, allowing students to collect and analyse comparative datasets and reflect on possible explanations for the flies' attraction.

As part of the University of Copenhagen's standard course evaluation procedure, students provided feedback on the programme, which again proved highly positive. Participants highlighted the value of combining lectures, laboratory activities and field components, including a three-night camping experience within the national park. The newly completed laboratory building was used for the first time during the course and proved highly effective for both teaching and practical exercises.

The programme concluded with a two-day visit to Mikumi National Park, giving students additional exposure to savanna ecosystems and their characteristic wildlife. Beyond the annual field course, we continued to host independent training activities and summer camps for additional partner institutions, providing logistical support and access to its residential facilities.

PLANS FOR 2026

- Continue to provide the facilities needed for training activities
- Support the organization of the 9th edition of the summer school
- Expand and strengthen collaboration with both local and international Higher Education Institutions (HEIs)

Students of the 2025 summer school ready for a field trip © Nikolaj Scharff

Holliness Mpangala preparing a comp

ENVIRONMENTAL EDUCATION

Promote environmental awareness and foster a culture of conservation and sustainability among younger generations

AGROFORESTRY AND GREENING

Develop sustainable alternatives to forest exploitation and reduce deforestation while enhancing biodiversity and ecosystem resilience

SUSTAINABLE ENERGY-EFFICIENT TECHNOLOGIES

Strengthen local livelihoods while improving health outcomes and environmental sustainability through appropriate technologies.

ost pit at a school © Vedasto Vahaye

COMMUNITY AND LIVELIHOOD

COMMUNITY SENSITIZATION

Increase community awareness and engagement across all programme components

INCOME-GENERATING ACTIVITIES

Enhance household economies and livelihoods by supporting and empowering local entrepreneurs

ECO-TOURISM

Facilitate educational field experiences that connect local communities and visitors with nature and conservation

Andekile Mlenga providing tools to a school environmental club to establish a school tree nursery © Silvia Ricci

ENVIRONMENTAL EDUCATION

WHY ENVIRONMENTAL EDUCATION

- Raises students' awareness of conservation, sustainability, and the unique biodiversity of their local environment
- Equips the next generation of community leaders with the knowledge and values needed for sustainable development
- Strengthens understanding of local environmental challenges and practical solutions
- Contributes to Tanzania's role in achieving the Sustainable Development Goals (Agenda 2030)
- Encourages active student involvement through practical, hands-on environmental initiatives

WHAT WE DO

- Deliver environmental education in 32 classrooms across 18 schools
- Support and connect school environmental clubs to encourage peer learning and collaboration
- Organize educational field visits to UMNP, VIC, and other key conservation sites
- Conduct student assessments and provide teacher training to improve teaching quality
- Promote international school partnerships, hands-on learning activities, and the construction of mud stoves in schools
- Coordinate World Environment Day celebrations to raise awareness and community engagement
- Carry out regular monitoring and evaluation to inform learning and programme improvements

ENVIRONMENTAL EDUCATION PROGRAMME IN THE KILOMBERO VALLEY

MACCO continues to implement the Environmental Education (EE) and teacher training programme launched in 2011 by Associazione Mazingira ODV. Since its inception, the initiative has reached 18 schools, 32 classes, and an average of 3,000 students annually, while training over 100 teachers. With AVJCF support since 2021, the programme has been strengthened across schools in the valley through classroom EE 40-minute sessions; training and mentoring of host teachers; drawing; establishment of school tree nurseries and tree planting; promotion of agroforestry for firewood and crop production; practical and creative workshops; waste recycling and composting; development of school gardens; introduction of efficient cooking solutions; twinning with Italian schools; and educational visits to Udzungwa Mountains National Park and the Visitor Information Centre.

In 2025, the EE programme reached a total of 3,050 pupils (1,891 boys and 1,159 girls), aged 10–17. As in 2024, due to time constraints within the school timetable, assignments and practical activities were conducted on weekends. The EE programme evaluation was conducted through mid-term and annual examinations, which recorded a 92.1% pass rate, further confirming improved environmental knowledge among participating pupils.

ENVIRONMENTAL EDUCATION ACTIVITIES FOR THE ULS

Under the Udzungwa Landscape Strategy (ULS), a comprehensive School Conservation Education Program was successfully implemented across 10 primary schools in Mlimba and Kilolo District Councils. Twenty teachers (two per school) were trained to deliver structured environmental education, equipping them with practical skills and dedicated manuals to support environmental sessions within school clubs. This intervention is estimated to directly reach at least 1,000 students.

All 10 schools established environmental clubs, each comprising 10 student members. These clubs serve as platforms for peer learning, environmental awareness, and active engagement in conservation topics relevant to the Udzungwa landscape.

To measure learning outcomes and knowledge uptake, assessments were conducted in nine of the ten schools. Results demonstrated strong performance, with an average pass mark of 79%, indicating a significant increase in students' understanding of environmental issues addressed during club sessions.

SCHOOL GARDENS AND COMPOSTING

Five schools—Kisawasawa Secondary School, Mwanihana Secondary School, Mang'ula A Primary School, Kiswanya Primary School, and Mlimani Primary School—have actively implemented school garden and composting initiatives to strengthen practical environmental education and sustainable agriculture practices. The schools are producing organic compost from locally available materials such as dry grass and manure to enrich agroforestry plots and improve soil fertility in their farming areas. The school gardens are supplying fresh vegetables for student meals, including pumpkin leaves, okra, bean leaves, matembele (sweet potato leaves), salad greens, and spinach, contributing to improved nutrition while reinforcing hands-on learning in sustainable land management.

TREE PLANTING IN SCHOOLS

A total of 1,899 tree seedlings were distributed free of charge to participating Environmental

Education (EE) schools, including Mang'ula Secondary (490), Mgudeni Primary (300), Kalunga Secondary (150), Kalunga Primary (300), Mang'ula A Primary (400), Udzungwa Primary (99), Darajani Primary (60), and Mhelule Secondary (100). The initiative aimed to reduce the time students and staff spend collecting firewood for school meal preparation while promoting long-term environmental sustainability. Fast-growing tree species were provided to ensure a sustainable source of firewood through re gular pruning. Fruit trees were planted to improve student nutrition. Additional timber and shade trees were included to enhance environmental resilience and create healthier school environments.

ENERGY EFFICIENT COOKING SYSTEMS AND KITCHENS

In partnership with host teachers, 29 improved mud stoves were constructed across 11 schools, benefiting 8,973 students. Compared to traditional three-stone fires, these stoves require significantly less firewood, thereby enhancing energy efficiency and helping to curb deforestation. In addition, they reduce indoor air pollution and smoke exposure, contributing to better overall health.

PLANS FOR 2026

- Extend the Environmental Education (EE) programme to 10 additional schools, in Mlimba, Kilolo and Kilombero districts
- Consolidate and maintain the 28 environmental clubs, promoting sustained participation and student leadership
- Strengthen the EE curriculum across the 32 existing classes by incorporating more practical, community-oriented activities, particularly in the area of recycling
- Broaden and enrich educational field visits to promote experiential learning
- Undertake a thorough evaluation and impact assessment in all 28 schools to improve programme content and delivery approaches

Students gathered around a compost pit
© Vedasto Vahaye

MACCO staff monitoring Kisawasawa tree nursery © Silvia Ricci

AGROFORESTRY AND GREENING

WHY AGROFORESTRY AND GREENING

- Restore forest cover while providing sustainable alternatives to forest-derived resources such as fuelwood and timber
- Safeguard soils, water sources, and biodiversity by promoting responsible and sustainable land-use practices
- Increase agricultural productivity to enhance food security and diversify household income sources
- Lower greenhouse gas emissions in line with global climate and environmental targets
- Strengthen climate change mitigation and adaptation through community-led reforestation and climate-smart farming approaches

WHAT WE DO

- Identify and train participating farmers
- Establish and maintain tree nurseries
- Produce and distribute high-quality seedlings
- Provide ongoing, on-farm technical assistance
- Promote the use of indigenous tree species
- Monitor tree survival and growth
- Advocate for the adoption of climate-smart land-use practices

AGROFORESTRY OVERALL ACHIEVEMENTS

In 2025, MACCO produced a total of 138,975 seedlings across different agroforestry initiatives:

- Mlimba District: 93,650 seedlings
- Kilombero District: 32,005 seedlings
- Msimba Village, Kilosa District: 13,320 seedlings

A total of 220 model farmers were trained:

- 120 from Mlimba
- 50 from Kilombero
- 50 from Kilosa

Out of these, 140 farmers adopted agroforestry practices:

- 96 from Mlimba
- 44 from Kilombero

Approximately 88% of the seedlings produced were for economic purposes, including cinnamon, cocoa, oil palm, and various fruit trees. These species allow farmers to begin generating income after approximately three years, while simultaneously contributing to environmental conservation.

To ensure sustainability in 2025, MACCO introduced a new approach to nursery management. Out of 10 nurseries established,

7 were designed as income-generating units, selling seedlings to farmers.

- In Mlimba District, six nurseries established during Phase I sold 31,650 seedlings, generating TZS 4,005,700, which was reinvested to support seedling production for Phase II (November 2025).
- In Msimba, 13,320 seedlings were produced and prepared for sale, with approximately 35% retained to ensure continued production in the following season.

AGROFORESTRY AND GREENING IN MLIMBA AND KILOMBERO DISTRICTS

To expand its agroforestry programme, with the support of Fondazione Foresta Futura (FFF), MACCO established community tree nurseries in four additional villages in Mlimba District that were not included under ULS.

Forty farmers (10 per village) were selected and engaged to manage the nurseries at village level, ensuring local ownership and cost efficiency by aligning activities with other ongoing interventions. The project planned to produce 60,000 seedlings, half of which will be sold to other farmers to support sustainability and provide planting material for the following season, building on successful approaches implemented under AWF support. Seedling production supported agroforestry and tree planting for farmers, schools, and community groups. Activities started in September 2025 to ensure timely availability for the 2025/2026 planting season.

In September 2024, MACCO received additional funding from Pennsylvania State University and the Hamer Foundation to promote agroforestry practices and sustainable cooking systems in five villages — Kisawasawa, Mang'ula A, Mang'ula B, Magombera, and Tundu—across Kilombero and Kilosa Districts.

The project aims to apply participatory land-use planning in these villages to improve access to local resources and reduce dependence on external inputs. It also promotes sustainable land management practices within designated agricultural and reforestation areas, positioning the villages as models for replication elsewhere.

Under this project, a total of 32,005 seedlings were distributed: 22,498 seedlings were provided directly to farmers, while 9,507 seedlings were planted along riverbanks (Njokamoni, Mwaya, Tundu Mtalawanda, and Kisawasawa) to support ecosystem restoration and watershed protection.

COCOA FARMING AND CONSERVATION

Cocoa farming offers strong economic potential, with market prices ranging from TZS 15,000–19,000 per kg and yields of up to 1.5 tons per hectare under Good Agricultural Practices (GAP). Sustainable cocoa farming can significantly increase household income, reduce pressure on forest resources, and contribute to environmental protection. However, many farmers face constraints, including limited access to quality seedlings, insufficient knowledge of GAP, and dependence on forest resources for cooking fuel, which can lead to forest encroachment.

In 2025, MACCO implemented the Sustain Eco project in 6 villages of Mngeta Ward with support from African Wildlife Foundation (AWF), aiming to demonstrate how environmental conservation can be directly linked to improved community livelihoods. In fact, the project focused on strengthening sustainable cocoa farming. Key activities included the selection and training of new and existing cocoa farmers, establishment of community-run nurseries led by youth and women, and delivery of Good Agronomic Practices (GAP) training from nursery management to harvesting. By increasing cocoa

productivity, expanding the number of farmers, and promoting sustainable conservation business models, the project reinforced the link between economic benefits, community engagement, and long-term environmental conservation within the Kilombero landscape.

In the first round, the project reached 60 new farmers (24 men and 36 women) and 143 existing farmers (102 men and 41 women), producing a total of 31,650 seedlings.

During the second round, MACCO identified and selected an additional 60 cocoa farmers (41 men and 19 women), conducted a baseline survey to assess their existing knowledge, and provided targeted training in Good Agronomic Practices (GAP), covering the entire production cycle from nursery establishment to harvesting.

Beyond farmer training, MACCO facilitated the establishment of a cooperative society that brings together first- and second-round participants, with a total membership of 70 trained farmers. To promote sustainability, the team also organized a Farm Field Day for cocoa farmers, creating opportunities to connect with key stakeholders, including financial institutions (banks) for loan access, suppliers of organic pesticides, and a leading AMCOS from Mbigu. In total, 214 farmers were reached through this initiative.

To strengthen peer learning and develop local champions in cocoa farming, MACCO organized an exchange visit for 18 outstanding farmers identified during project implementation. These farmers visited three high-performing cocoa farms in Mbigu to gain practical insights and further enhance their skills.

At the end of 2025, MACCO received funding from Rete Clima, an Italian network that works with the private sector to promote sustainable development, decarbonization, the circular economy, and reforestation (https://www.reteclima.it/en/). Building on the experience gained through the Sustain Eco initiative, the funds were invested in an agroforestry project in Msimba Village (Mikumi Ward), focusing on improving sustainable cocoa production to strengthen household incomes and reduce pressure on forest resources.

The project provides GAP training and quality cocoa seedlings through community-established nurseries, free of charge, along with seedlings of other tree species for domestic use.

In its first phase, the project introduced the initiative to village and ward leaders, selected 50 farmers (33 men, 17 women), conducted baseline surveys, trained participants, identified plots, and established a cocoa nursery.

Five thousand seedlings were produced against a 1,500-seedling target through a cost-sharing approach, with farmers supplying nursery materials while the project provided polythene tubes and equipment. This collaborative model ensures sustainability by fostering community ownership and shared responsibility.

Cocoa farmers' GAP meeting © Silvia Ricci

ETHNO-BOTANICAL GARDEN AT UEMC

Between August and December 2025, MACCO launched an ethnobotanical garden and stingless beekeeping (meliponiculture) initiative in Mang'ula Ward, Kilombero District, thanks to a grant from Viaggi & Miraggi, an Italian tour operator and MACCO's partner in ecotourism. The project aims to generate income through seedling and honey production, support ecosystem conservation, reduce reliance on forest resources, and promote sustainable livelihoods. It also raises awareness of traditional medicine and ecosystem services among local communities and visiting eco-tourists.

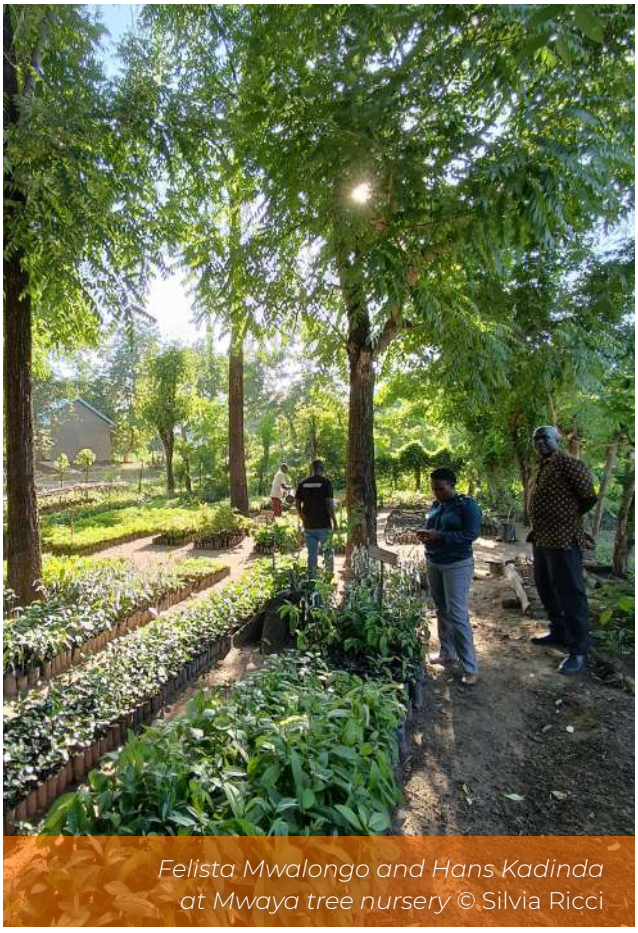
Key activities completed include site selection, seed collection (1,170 seeds across 39 species, exceeding the first-semester target), production of 1,000 biodegradable seedling tubes, construction of seedbeds (50% of total planned beds) and full garden fencing. These efforts engaged 15 direct beneficiaries, including two garden attendants and 13 workers involved in various activities, using a participatory approach and locally sourced materials.

By the end of the year, 774 seedlings had been produced (66% of the 1,000-seedling target), while species diversity exceeded expectations (118% of the target). Challenges included seasonal seed availability, unpredictable weather affecting germination, and seedling predation.

The project demonstrates early success in combining environmental restoration, cultural heritage preservation, and sustainable income generation, setting the stage for the second-semester installation of beehives and expansion of garden activities.

PLANS FOR 2025

- Oversee and monitor the distribution and planting of seedlings produced in 2025 to ensure proper establishment and survival
- Explore and assess innovative sustainable farming approaches, including syntropic agriculture, climate-smart techniques, regenerative agriculture, and permaculture
- Expand agroforestry and reforestation initiatives to additional villages and new districts
- Implement an awareness campaign encouraging farmers to shift from monoculture systems toward more sustainable and diversified agricultural practices
- Scale up cocoa farming and expand Good Agricultural Practices (GAP) training among farmers to increase productivity, improve crop quality, and promote sustainability



Felista Mwalongo and Hans Kadinda at Mwaya tree nursery © Silvia Ricci

MACCO SEET officers inspecting movable stoves at the office in Mang'ula B © Silvia Ricci

SUSTAINABLE ENERGY-EFFICIENT TECHNOLOGIES (SEET)

WHY PROMOTING SEET

- Decrease dependence on firewood and charcoal as the main sources of household energy
- Reduce pressure on forest resources by promoting cleaner cooking alternatives
- Lower household fuel expenses through the introduction of efficient, smokeless technologies aligned with national energy strategies in Tanzania
- Improve indoor air quality and support better health outcomes at household and community levels
- Cut carbon emissions associated with deforestation and inefficient biomass burning
- Increase awareness of sustainable resource use while reducing the time and physical burden of cooking, especially for women and girls

WHAT WE DO

- Construct mud stoves in schools and individual households
- Support the production and marketing of alternative, sustainable charcoal
- Organize awareness-raising events to promote sustainable, energy-efficient technologies (SEET)
- Provide hands-on training and technical support to local women
- Carry out regular monitoring and evaluation to assess impact and guide improvements

Under the Sustainable Energy Efficiency Technology Programme, the MACCO team trained a total of 99 stove makers from 26 villages across five districts - Kilosa, Kilolo, Kilombero, Mlimba, and Ifakara Town Council. These stove makers were regularly monitored, and MEL data were collected.

In 2025, a total of 4,617 improved stoves were constructed at the household level, achieving 94% of the annual target. These stoves benefit 22,713 household members. The results were made possible through support from multiple donors, including the Hempel Foundation, AVJCF, and Pennsylvania State University.

In particular, under the ULS Energy Efficient Stoves (EES) adoption programme, 25 artisans (72% women) from five villages in Mlimba and Ifakara Tc. were trained to construct improved household stoves, enhancing energy efficiency and reducing pressure on forest resources. These stoves benefit a total of 6,737 household members. Monitoring was carried out across the five villages. The supervision facilitated the collection of feedback and the resolution of any challenges.

For the Alternative Charcoal Production and Factory Establishment activity, the briquette production facility in Ching'anda Village, initially funded by the Hempel Foundation, was completed using AVJCF resources to cover the remaining costs. Production has not yet begun due to the need for comprehensive quality checks; however, local implementers have continued carbonizing raw materials. During trial production, one of the four tested parameters did not meet international standards. MACCO is now preparing to address the recommendations provided by TIRDO after the laboratory tests. All other production requirements have been completed, and once these final adjustments are addressed, the facility will be fully operational.

In 2025, the alternative charcoal factory in Mang'ula upgraded its extruder machine to improve both production capacity and the quality of the briquettes produced. A total of 12 tons were produced and sold. However, overall production remained low due to machinery challenges and the absence of a carbonizer to accelerate the production process.

PLANS FOR 2026

- Extend the Sustainable Energy Efficient Technology (SEET) initiative to three additional villages in Kilolo District
- Introduce income-generating activities (IGAs) for stove makers, focusing on the production and sale of portable clay stoves in 12 villages across Ifakara TC, Mlimba, and Kilolo Districts
- Strengthen the capacity of all project staff in the use of data collection tools to enhance monitoring and reporting.
- Improve the production and quality of alternative charcoal briquettes at the Ching'anda factory
- Promote the sale of alternative charcoal briquettes in Ching'anda and neighboring villages to stimulate the market for this technology
- Identify sales agents for briquettes in the five villages surrounding the Ching'anda factory

A village woman with her self-constructed mudstove © Silvia Ricci

COMMUNITY SENSITIZATION AND CAPACITY BUILDING

Under the ULS Adult Education and Awareness Raising on Conservation activity, MACCO conducted a conservation awareness campaign in ten villages across Mlimba and Kilolo districts to promote sustainable technologies. The campaign featured ten public meetings attended by 2,797 participants (49% women) and focused on environmental education, energy-efficient technologies, and agroforestry. Key topics covered included briquettes, improved mud stoves, alley cropping, and the impacts of forest degradation.

STAFF CAPACITY BUILDING

MACCO strengthened its internal institutional capacity through a series of targeted trainings. All staff participated in a two-day training on entrepreneurship and market-oriented production to enhance income-generating strategies of MACCO employees and ensure sustainability of project interventions. In addition, a two-day session was conducted by MACCO CEO for all staff on internal operational manuals to improve compliance, coordination, and organizational efficiency. Seven staff members received an intensive five-day training on project proposal writing to build MACCO capacity in resource mobilization and project development. Furthermore, the two accountants attended 5-day specialized QuickBooks training in Morogoro to strengthen financial management and reporting systems.

PLANS FOR 2026

- Conduct sensitization meetings in additional villages to increase awareness of ULS and MACCO activities
- Engage local leaders and stakeholders in participatory planning to align conservation efforts with community livelihoods expectations and goals.
- Utilize culturally appropriate materials, including posters, flyers, and radio broadcasts, to enhance outreach
- Review feedback and lessons learned from the previous years to improve and refine community engagement strategies. interventions

Project Coordinator, Felista Mwalongo, talking to beneficiaries in Mlimba District © Silvia Ricci

INCOME-GENERATING ACTIVITIES

MACCO has implemented a range of income-generating initiatives to support local livelihoods and promote sustainable practices. In Ching'anda Village, an alternative charcoal factory was established to create local employment, reduce reliance on traditional charcoal, and foster a sustainable green economy at the community level.

In Mlimba and Kilolo Districts, 99 stove makers were trained and received a small contribution to construct improved cookstoves. Of these, 60 individuals who demonstrated strong commitment to the project were further trained in producing movable stoves fueled by briquettes, providing them with additional income-generating opportunities.

In Mlimba and Kilombero, 10 tree nurseries (six in Mlimba and three in Kilombero one in Kilosa) were established and are managed by trained local farmers supplied with seeds and planting bags. The farmers sold 31,650 seedlings, generating a total income of 4,005,700 TSH.

In Mang'ula Ward, the ethnobotanical garden and stingless beekeeping (meliponiculture) project will generate income through seedling and honey production while supporting environmental conservation.

Ecotourism activities in the Udzungwa Mountains attracted 39 international tourists across 3 trips, raising €3,800 in donations, further contributing to community development and sustainable livelihoods.

PLANS FOR 2026

- Assist trained stove makers in expanding the production and sale of portable clay stoves across 10 villages
- Provide support to expand the distribution and sale of alternative charcoal briquettes
- Facilitate the access to raw materials and equipment needed for briquette production
- Improve ecotourism activities to attract more visitors and generate community income
- Strengthen tree nursery operations to increase seedling production and sales
- Support production and sale of medicinal plant seedlings and honey in the ethnobotanical garden to generate income while promoting environmental conservation
- Monitor and assess the economic impact of income-generating activities (IGAs) to inform and guide future interventions.

Holliness Mpangala and Suna Kulolela showing a movable stove © Silvia Ricci

ECO-TOURISM

After the successful relaunch of ecotours in 2024, three ecotours were organized in 2025, bringing a total of 39 Italian visitors to Tanzania to visit MACCO's community-based and conservation initiatives.

Participants visited local villages, schools, and the forests of the Udzungwa Mountains, gaining direct insight into conservation efforts and development activities in the area. The itineraries continued with a safari in Ruaha National Park and concluded with a short stay in Zanzibar, offering visitors the opportunity to experience three distinct Tanzanian landscapes in a sustainable and culturally respectful way.

Each tour package included a financial contribution to support MACCO's ongoing projects, positioning ecotourism as both an awareness-raising initiative and an effective fundraising mechanism. The trips were organized in partnership with the Italian tour operator Viaggi e Miraggi (VeM) and the cooperative Biosphaera, with local staff working alongside Italian guides throughout the journey, particularly during the Udzungwa component and beyond.

Ecotourism remains a valuable approach for connecting international visitors with the realities of conservation and community development challenges in Tanzania.

PLANS FOR 2026

- Expand the number of ecotourism activities to raise visibility and generate additional fundraising opportunities
- Design and promote new trekking routes and culturally focused trails
- Partner with local homestays and eco-lodges to deepen community participation in tourism initiatives
- Promote the ethnobotanical garden and its products to tourists to enhance visitor engagement and generate income
- Build the capacity of local staff to support tours and deliver high-quality visitor experiences

Ecotourists in the Udzungwa Mountains National Park © Massimo D'Ambrosi

UDZUNGWA LANDSCAPE STRATEGY (ULS)

In 2023, with support from the Hempel Foundation, a network of partners developed the Udzungwa Landscape Strategy (ULS), a 20-year vision to protect this globally significant biodiversity landscape while advancing social equity and community-led conservation. Built through extensive consultations, the ULS aligns conservation of protected areas with sustainable livelihoods, participatory governance, and a centralized Monitoring, Evaluation and Learning (MEL) system.

The ULS (https://udzungwalandscapestrategy.org) is guided by four Strategic Objectives (SOs):

SO1 – Protected Areas

strengthening the effectiveness and conservation capacity of the three core protected areas.

SO2 – Communities

enhancing local livelihoods and wellbeing while encouraging sustainable forest stewardship.

SO3 – Collaboration & Governance

fostering improved relationships and participatory governance among communities and all stakeholders in the Udzungwa landscape.

SO4 – Monitoring, Evaluation, and Learning (MEL)

establishing a centralized, transparent MEL system to support adaptive and effective implementation.

MACCO was responsible for leading the implementation of SO2 to SO4, while STEP coordinated SO1. Project implementation officially began in 2024, with both partners working in parallel to deliver their respective components.

Under SO2, the project prioritized the expansion of sustainable livelihood interventions, including the promotion of energy-efficient technologies and alternative cooking solutions to reduce pressure on forest resources, ongoing technical support for trained artisans, agroforestry initiatives, environmental education, and public awareness-raising activities.

Through AVJCF funding, MACCO was able to scale up its sustainable energy efficiency and conservation programme to five new villages neighboring the five communities previously supported by Hempel by introducing and promoting alternative charcoal production and energy-efficient stoves. In the original villages, in 2025, tree planting and agroforestry activities were implemented to ensure a reliable supply of raw materials—such as agricultural residues, firewood, and pruned branches—for alternative charcoal production and energy-efficient technologies.

Community-based adult education and awareness-raising sessions were conducted across all 10 villages (both Hempel- and AVJCF-supported) to strengthen understanding of conservation principles and highlight the benefits of alternative energy technologies, thereby fostering community acceptance and long-term sustainability. In parallel, school conservation education programmes were carried out in the same 10 villages to enhance knowledge of environmen-

tal protection, alternative charcoal use, and improved cooking technologies, promoting lasting behavioral change at both household and institutional levels.

Under SO3, in 2025 MACCO implemented several activities, including capacity-building workshops delivered to Village Natural Resource Committees (VNRCs) and village leaders across multiple communities. These trainings strengthened knowledge on participatory forest management, human rights, forest access, fire management, and natural resource governance. They also improved leadership, reporting skills, and the development of structured VNRC work plans, while increasing awareness of protected area boundaries and community responsibilities.

The process fostered stronger collaboration between communities, protected area managers, government authorities, and partners, and supported the mapping of culturally and ecologically important spiritual sites, promoting indigenous knowledge and community-led conservation. Governance under the ULS was further reinforced through the establishment of Steering and Secretariat Committees and stakeholder meetings at district and regional levels, improving coordination and alignment with government priorities.

Finally, **under SO4**, substantial progress was achieved in strengthening evidence-based conservation and adaptive management within the ULS. Led by the UEMC and partners, efforts focused on consolidating long-term ecological monitoring and improving performance tracking systems.

The UEMC continued core biodiversity monitoring, including camera trapping, line transect surveys in Mwanihana (UMNP) and Uzungwa Scarp Nature Forest Reserve (USNFR), and invertebrate surveys to maintain long-term datasets. These efforts were complemented by a targeted primate monitoring initiative in Ndundulu Forest within Kilombero Nature Forest Reserve, focusing on the critically endangered kipunji and other primate species. Results indicated stable primate populations in well-protected areas, but lower abundance in less protected forests, highlighting key conservation priorities. A re-census of the kipunji confirmed extremely low densities, reinforcing the need for targeted conservation actions.

A key achievement in 2025 was the development of a Tableau-based MEL dashboard integrating agreed KPIs across all ULS objectives, supported by MEL and data management training for 22 partner staff. ULS partners also jointly defined indicators and targets, creating a harmonized framework for measuring progress and impact.

In addition, ULS activities are being scaled up across Strategic Objectives 2–4, supported by the Hempel Foundation and additional funding from the Aage V. Jensen Charity Foundation. Findings from monitoring activities are being shared through the ULS dashboard, website, AMNGO Report 2024, and scientific platforms to ensure transparency and support adaptive management.

ULS

https://www.udzungwalandscapestrategy.org/

OUR PEOPLE

In 2025, MACCO prioritized strengthening its institutional capacity, expanding its operations, and restructuring its management. The organization initiated a recruitment process to bring in key qualified personnel, including a new Accountant, an HR and Administration Manager, and a Managing Director, with completion expected in 2026. MACCO also underwent a transition in CEO leadership. The organization also engaged two external consultants to enhance strategic planning, improve operational efficiency, scale up programmes, and respond to emerging opportunities in conservation and community development.

The organization is structured around a clear governance and management hierarchy, led by a **Board of Directors** providing strategic oversight and supported by an **Advisory Board**. Day-to-day operations are managed by the **Chief Executive Officer (CEO)**, who will be supported by the **Managing Director** by 2026. In addition to the current core departments - Finance, Research and Monitoring, and Community and Livelihoods - the Human Resources and Administration Department will be established in 2026. These departments are supported by specialized and operational staff to ensure effective programme delivery at the field level.

The **HR and Administration and Finance Departments** will play a cross-cutting role by strengthening staff capacity in leadership, logistics, financial management, and strategic planning, while ensuring transparent use of resources and effective coordination across the organization.

The **Research and Monitoring Department** focuses on biodiversity conservation, supports scientific research, and provides higher-education and training opportunities for international students and TANAPA staff.

The **Community and Livelihoods Department** leads community-based interventions: environmental education, ecotourism, awareness-raising activities, long-standing agroforestry and tree-planting programmes, promotion of sustainable energy-efficient technologies (SEET), income-generating activities, that support local economic development while safeguarding ecological balance.

MACCO places strong emphasis on staff development through training, educational opportunities, and support for formal qualifications. The organization is equally committed to fostering a safe, inclusive, and respectful workplace that promotes gender equality, labour rights, and human dignity.

MACCO employed 29 core staff members, 10 volunteers and interns, with the total workforce occasionally exceeding 40 through the engagement of short-term labourers.

MACCO staff promoting SEET during Nane Nane Celebration (8th of August) © Vedasto Vahaye

STEVEN SHINYAMBALA Chief Executive Officer – CEO

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MACCO also engaged the following collaborators, volunteers, interns, and temporary staff to support implementation and field activities:

VEDASTO VAHAYE
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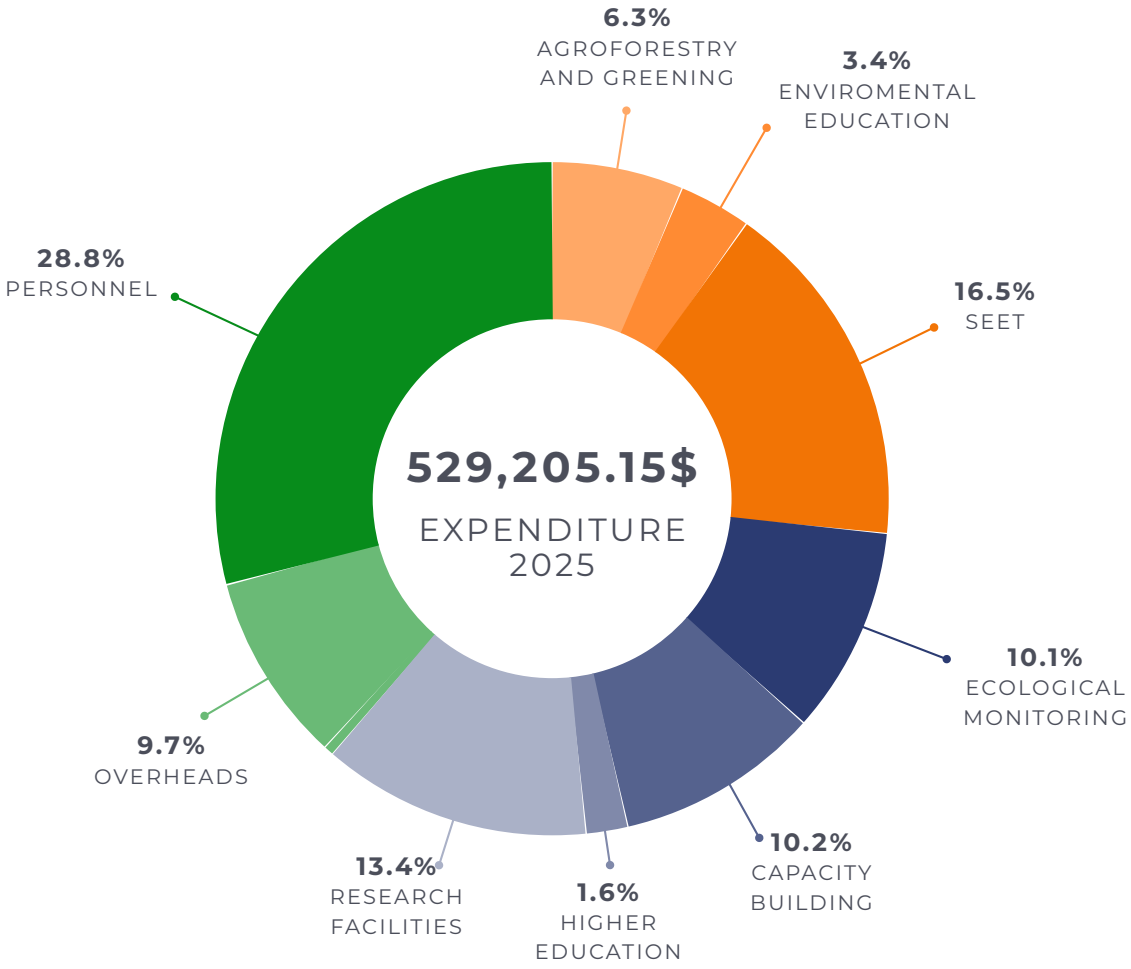
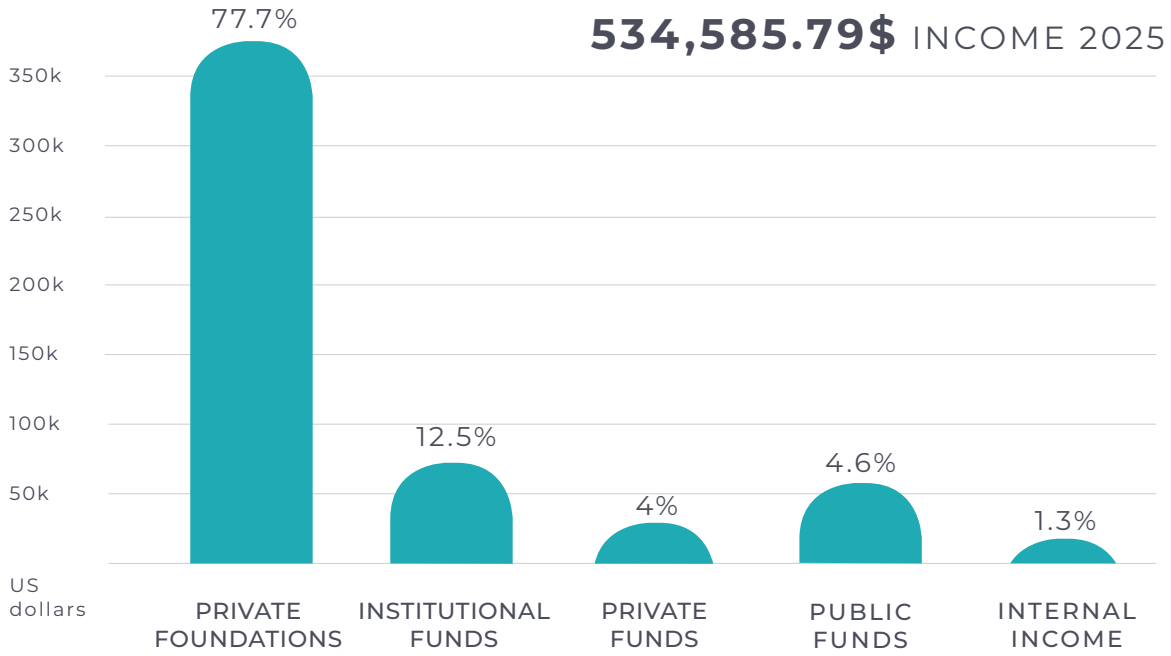
MACCO Community and Livelihoods staff © Andekile Mlenga

Top image: *Felista Mwalongo and Andekile Mlenga with mud stove makers in Mlimba District* © Silvia Ricci
Bottom image: *MACCO Staff at UEMC* © Silvia Ricci

FINANCIAL OVERVIEW





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Kimboza Nature Forest Reserve – **KNFR**

Uzungwa Scarp Nature Forest Reserve – **USNFR**

Udzungwa Mountains National Park – **UMNP**

Ward and Village Government Authorities

Inside backcover image: *Mwaya tree nursery* © Silvia Ricci

Backcover image: *Sanje mangabey* © Massimo D'Ambrosi

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