

lignaverda[®]



ANNUAL REPORT 2024





lignaverda[®]

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Foreword

"Trees are living symbols of peace and hope. A tree has roots in the soil yet reaches the sky. It tells us that in order to aspire we need to be grounded." – WANGARI MAATHAI

As we reflect on 2024, it is with great pride that we share the milestones Lignaverda has achieved over the past year. Our journey continues to evolve, reinforcing our commitment to **landscape restoration** and **community empowerment**.

SENEGAL

Restoring at scale. In Senegal, Lignaverda restored nearly **2,000 additional hectares**. Our total reforested area in Senegal now amounts to **6,500+ hectares** – the size of 10,000 football fields. This achievement places us among the **largest-scale landscape restoration developers globally**. Every hectare is sown with **native, drought-resistant species**, proving our model works – at scale, in tough conditions, and with lasting impact.

Local power, lasting forests. We do not just restore land – we build ownership. Our forests are protected through **durable fencing, inclusive governance, and community-led stewardship**. By placing decision-making in local hands, we ensure forests are not only growing but also preserved and valued by the people who depend on them most.

Engineering resilience. Lignaverda operates in **some of the world's most climate-disrupted regions**, where

prolonged droughts, land degradation, and failing agriculture have already forced families to **migrate** – fuelling resource scarcity, instability, and inter-community conflict. Soil studies have shown that **the region lacks the clay layer needed to retain water**, making conventional water solutions (e.g. traditional *bouli* reservoirs) ineffective. To address this challenge, Lignaverda implements climate-smart agricultural solutions designed for these conditions. In partnership with OvO, VITO, and with support from the Flemish International Climate Action Programme, we have drilled a 170 m deep borehole to support small-scale horticulture farming which will be implemented as a prelude to future – unirrigated – agroforestry systems that will be developed on the reforested sites. This is technology with purpose – tailored to the terrain, delivering both environmental regeneration and socio-economic stability **where it is needed most**.

NAMIBIA

A royal endorsement. In Namibia, Lignaverda reached a symbolic milestone with the visit of **His Majesty King Philippe of Belgium** to Namibia. His presence – alongside the **President of Namibia** and senior Namibian officials – underscored the growing international recognition of nature-based solutions in the fight against climate change. The King was guided through an exhibition at the Namibian State House, showcasing Lignaverda's vision, impact, and potential to scale reforestation where it matters most.

Partnership with purpose. As part of this visit, we signed a formal **Memorandum of Understanding** with the **Government of Namibia**. This agreement, supported by the Ministry of Environment, Forestry and Tourism (MEFT) and in collaboration with local communities, launched a pilot project in Siya. Located in the country's semi-arid north, the project aims to demonstrate how **science-based reforestation** can address **desertification**,

regenerate ecosystems, and **build local resilience**. A 32-hectare forest has already been restored, serving as a living laboratory to study dryland reforestation's contribution to **carbon sequestration and ecological recovery**.

Science-driven innovation. Lignaverda is working closely with **Prof. dr. ir. Ivan Janssens** (University of Antwerp) to explore cutting-edge techniques that can unlock even greater impact in sandy soils. This includes the use of **silicates** – by-products from Namibia's mining industry – combined with **biochar** derived from **invasive species such as *Acacia mellifera*** (blackthorn). When incorporated into the soil, these amendments improve soil structure and fertility while permanently storing CO₂ below ground. This dual strategy of **carbon removal and soil regeneration** could redefine what is possible for dryland landscape restoration.

RESEARCH AND INNOVATION

Scaling with AI. We are proud to announce the creation of the **Lignaverda Chair at KU Leuven University**, made possible through the generous support of our **Chairman, Steven Buyse**. This initiative will harness the power of **AI and remote sensing to transform**

forest monitoring – enabling **rapid tree counting, species identification, biodiversity assessments, and early-stage carbon measurement** at scale. It marks a key step in our commitment to building a more transparent, data-driven approach to reforestation.

THANK YOU

None of this would be possible without the dedication of our **team**, the trust of our **partners**, and the support of our **stakeholders**. As we move forward, we remain focused on restoring degraded landscapes, strengthening communities, and delivering measurable impact for the planet. At Lignaverda, we are not just growing trees – **we are laying the foundation for a thriving, sustainable future**.



Werner Sels,
Founder of Lignaverda

Measuring what matters

TEAM & OPERATIONS

83.7%

of our team directly
engaged in fieldwork

46.1%

female staff in field
or leadership roles

110

hours average training
per field team member

COMMUNITY IMPACT

3,270

families benefitting
from our programs

108

villages engaged
in restoration efforts

24,071

individuals reached
across all sites

6,430

seasonal jobs
created locally

37

recurring full-time jobs
within local communities





ENVIRONMENTAL RESULTS

5,924

ha of land reforested using
native species since 2020

42 MILLION

seeds sown
in semi-arid landscapes

250

trees per hectare
reaching maturity

39

native, drought-resistant
species introduced for biodiversity

WATER ACCESS

3

sites now equipped
with irrigation systems –
1 with own borehole

15,000

litre of clean water supplied
daily to communities

What makes Lignaverda unique

HIGH-INTEGRITY CARBON PROJECTS

VM0047 certification. Our projects follow VERRA's VM0047 certification, the highest-integrity reforestation methodology available globally and the only one validated by the Integrity Council of the Voluntary Carbon Market (ICVCM). This guarantees credibility, project additionality, carbon storage permanence, and community benefits – aligned with global best practices.

Dual certification with CCB. In addition to carbon removal, our projects undergo review for VERRA's Climate, Community, and Biodiversity (CCB) impact label, ensuring that we deliver measurable co-benefits for people and nature.



Monitoring, reporting, and verification (MRV). From tree tracking to on-the-ground field audits, every hectare is monitored, every activity is documented, and every impact is measured – in line with VERRA's VM0047 and CCB's requirements.

Independent dual-level auditing. We voluntarily subject our operations and finances to third-party audits, reinforcing our commitment to transparency, financial discipline, and operational accountability.

On the path to vetting and rating. We are actively working toward being vetted and rated by leading climate market evaluators (e.g. Pachama) and rating agencies (e.g. BeZero), to strengthen partner confidence and signal long-term quality.



WORKING WHERE IT MATTERS MOST

18+ years in semi-arid regions. Since 2008, we have restored 17,000+ hectares of degraded land in semi-arid ecosystems, operating where climate disruption is visible and felt most as well as already displacing people and collapsing ecosystems.

Work where others do not. We focus on areas with poor soils, minimal rainfall, and weak infrastructure – environments that are neglected by most carbon developers but critical to planetary stability.



Proven capacity to scale. With 6,500+ hectares already restored in Senegal, our projects rank among the largest globally. This shows that meaningful scale is achievable – even in the world's most climate-disrupted environments.



A SCALABLE, LOCALLY-ANCHORED MODEL

Seed-based reforestation. We use a direct seeding method tailored to dryland environments, reducing costs, accelerating deployment, and eliminating complex nursery logistics.



Driven by local communities. Our field model is powered by local actors with community members leading activities across land preparation, sowing, fencing, and monitoring. Every reforestation effort is rooted in local ownership and local execution.



Engineered for water efficiency. To overcome degraded, compacted soils, we design half-moon shaped bunds using the Vallerani technique – a water retention method that breaks the soil surface and channels rainwater into crescent-shaped pits. Seeds are sown directly into these bunds, where moisture is captured, improving germination and early tree survival.

EMPOWERING COMMUNITIES FROM THE GROUND UP

Job creation at every stage. We embed both short-term and recurring jobs in every project stage – creating income from day one and building the skills for long-term stewardship.

Sustainable local economies. Reforested areas are managed to generate long-term revenue through the harvesting of gum arabic, vegetal oil, fruit, grass, and honey. These products not only create economic independence but also strengthen local food security by diversifying nutrition and reducing reliance on livestock-based systems.

Community-led governance. Local Community Forest Management Committees (CFMCs) govern each site with formal bylaws and equitable benefit-sharing frameworks.

High participation of women. Women represent 70%+ of local participants in project areas, particularly in seed collection and non-timber forest product (NTFP) harvesting – ensuring inclusive, household-level impact.

Clear land access and rights. All projects follow a Free, Prior and Informed Consent (FPIC) approach, concluded by formal agreements with governments, traditional authorities, and local communities – ensuring clarity on land use, project rights, and benefit sharing.

TECHNOLOGY, AND FULL INTEGRATION

Scientific foundations. Our methods are co-developed with leading academic institutions including Ghent University, KU Leuven, the Namibia University of Science and Technology and the University of Antwerp – ensuring ecological rigour.

AI-powered forest monitoring. Through the Lignaverda Chair at KU Leuven, we are pioneering the use of AI and remote sensing to track tree growth, species diversity, and carbon capture – at scale.

Biodiversity reforestation strategies. All reforestation is done with a rich mix of native, drought-resistant species, improving long-term ecosystem resilience and biodiversity outcomes.

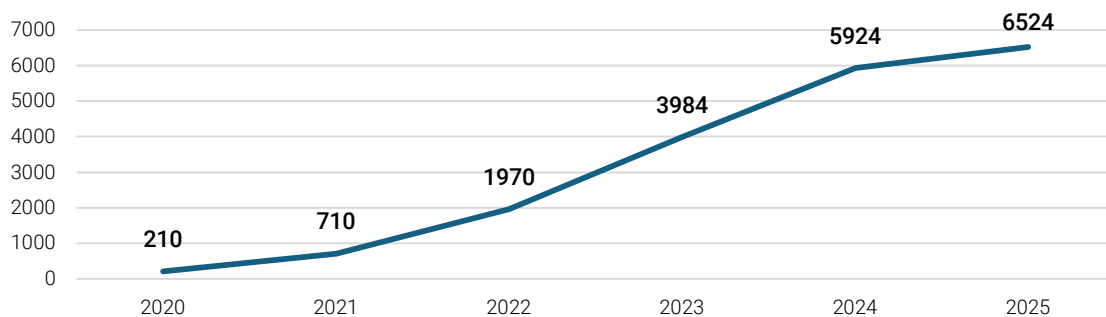
No intermediaries. Lignaverda is a fully integrated developer. We plan, manage, implement, and monitor all projects internally – with no intermediaries. This ensures full control over quality, traceability, and maximum efficiency. Every euro flows directly to the field, maximizing impact for local communities and ecosystems where it is needed most.

Our projects



Senegal

In 2024, thanks to the outstanding efforts of Lignaverda's Senegalese team, in close collaboration with local communities and the national Great Green Wall Agency (ASERGMV), **a record area of 1,940 hectares** was reforested across seven sites in the communities of Syer and Mboula. This brings Lignaverda's cumulative reforestation total in Senegal to 5,924 hectares by year-end.



Total surface area in hectare reforested by Lignaverda in Senegal (2020 – 2025).

In Syer, where 1,785 hectares had already been restored in 2020, 2021, and 2023, three new sites were added in 2024: Kalom (600 ha), Nassy (240 ha), and Bockineddo (300 ha). We are equally proud to announce that the community of Mboula – located just east of Syer – joined our reforestation efforts for the first time. Four sites were restored in Mboula: Wendou Mouthiétéki, Wouro Séno, Boboral, and Mbéloné Kaadié, each covering 200 hectares.

In 2025, Lignaverda will expand its reforestation efforts by restoring 600 hectares in the community of Syer, distributed across three new sites – Bellel Aya, Belli Gawdi Cherif, and Tagar – each covering 200 hectares. For the first time, all sites will be fully ploughed using the Delfino 3S plough, replacing the earlier mixed use of the Delfino 2S. This upgrade allows for a significant increase in operational efficiency, with the capacity to plough up to 20 hectares per day.



Our projects

Year	Community	Site	ha	Perimeter	Villages	People
2019 – 20	Syer	Dambé (160+ 50 ha Bowde Doudal)	210	6,150	4	790
2021	Syer	Gadd Keur Massamba (Les 5 Villages)	500	9,800	7	1,751
2022	Tessékéré	Aly Thierno (= Tessékéré 2)	602	12,500	10	1,726
		Labardy (= Tessékéré 3)	658	10,050	7	934
2023	Syer	Wendou Delby	600	10,200	7	1,975
		Diéry	475	9,500	8	2,553
	Labgar	Loumboul Djiby (= Labgar 2)	478	9,515	18	4,145
		Ngaydoum (= Labgar 3)	461	11,000	22	5,367
2024	Mboula	Wendou Mouthiétéki	200	5,700	3	391
		Wouro Séno	200	5,700	4	668
		Boboral	200	5,700	5	554
		Mbéloné Kaadié	200	6,400	3	414
	Syer	Kalom	600	9,900	7	1,688
		Nassy	240	7,000	1	280
		Bockineddo	300	7,500	2	835
2025	Syer	Bellel Aya	200	5,700	TBD	TBD
		Belli Gawdi Cherif	200	5,700	TBD	TBD
		Tagar	200	5,700	TBD	TBD
TOTAL			6.524	14.3715	108	24.071

Lignaverda Portfolio 2019 – 2025. Note: TBD = to be determined.

Community engagement and employment impact

The implementation of these projects is deeply rooted in community participation. **Local villagers play a central role in every step** of the process, from seed and manure collection to sowing, fencing, and long-term monitoring. These activities are coordinated through **Community Forest Management Committees (CFMCs)**, created under Lignaverda's guidance. Their mandate is to ensure the long-term protection and sustainable management of the newly restored forests. By placing local people at the centre of operations, the programme generates meaningful employment in economically underdeveloped areas severely affected by climate change.

In all past projects, communities have been **remunerated for their work**. This includes 200 hectares restored in Syer in 2020, 500 hectares in 2021, and 1,075 hectares in 2023 across the sites of Wendou Delby and Diéry. In 2022, 1,260 hectares were reforested in Tessékéré, and in 2023, another

939 hectares in Labgar, including the villages of Gaydoum and Loumboul Djibby. In 2024, the 1,940 hectares across Syer and Mboula were added. For all reforested sites, 24 rangers are employed annually to protect and monitor the plots for several years after sowing, thus creating **recurring jobs** and supporting long-term project sustainability.

Notably, **women make up the majority of the local workforce** involved in reforestation. In 2024, 70% of the 1,705 participants in seed and manure collection or sowing were women. This gender balance significantly increases the likelihood that the income generated from reforestation will be reinvested in households, creating broader socio-economic benefits for entire communities. In some villages, such as Nassy and Mbéloné Kaadié, women represented over 80% of participants. In Nassy, the participation rate reached an impressive 91% of the total village population, demonstrating strong community ownership.

		Women	Men	All	% women	Population	% participating
Syer	Bockinneddo	200	89	289	69%	835	35%
	Nassy	203	51	254	80%	280	91%
	Kalom	181	183	364	50%	1,494	24%
Mboula	Boboral	119	39	158	75%	554	29%
	Wouro Séno	167	36	203	82%	668	30%
	Wendou Mouthiétéki	153	71	224	68%	391	57%
	Mbéloné Kaadié	172	41	213	81%	414	51%
TOTAL		1195	510	1705	70%	4636	37%

Participants to either seed and manure collection or sowing the 7 reforestation projects of 2024.

Biodiversity and ecosystem restoration

Our biodiversity strategy is equally robust. In all projects, we work exclusively with native, drought-tolerant tree species selected in consultation with local communities. In 2023, fourteen different species were sown, including *Acacia senegal* (from which gum Arabic is harvested), *Ziziphus mauritiana*, *Sclerocarya birrea*, *Balanites aegyptiaca*, and *Faidherbia albida*. These species not only support ecological regeneration but also hold strong potential for sustainable use and long-term economic value.

Socio-economic impact: beyond reforestation

At Lignaverda, “**together, we restore ecosystems, we improve livelihoods**” is more than a slogan. In the rural areas of Senegal, poverty and environmental degradation form a vicious cycle. Communities often depend on livestock herding and unsustainable wood harvesting, which accelerate land degradation and further deepen poverty. Because the only short-term income between sowing and forest maturity comes from the sale of grass, there is a risk that community members may breach fencing to graze livestock or even cut down young trees for fuel. Addressing this challenge requires more than ecological restoration – it demands social innovation and economic alternatives.

Recognising the socio-economic hurdles confronting rural communities within the Senegalese Great Green Wall area, Lignaverda has instituted a comprehensive **impact program** aimed at nurturing **long-term protection** of new forest plots. This initiative, launched in 2023, revolves around three strategic pillars:

Capacity building for forest protection. Members of the CFMCs receive in-depth training in self-organisation, forest governance, and on-the-ground protection practices. Together with local partners, Lignaverda facilitates the co-development of committee statutes and strengthens the financial and managerial literacy of committee members to ensure long-term autonomy and effectiveness.

Micro-economic entrepreneurship training.

Lignaverda supports small-scale income-generating activities that take advantage of the region's unique semi-arid environment. These ventures include producing soap from *Balanites aegyptiaca* seed oil, harvesting gum Arabic from *Acacia senegal*



trees using sustainable methods, converting cow dung and organic waste into eco-friendly fire bricks, and harvesting and marketing honey from reforested, flower-rich ecosystems. These initiatives demonstrate the economic value of forest preservation while diversifying household incomes.

Implementation of loan-based economic activities.

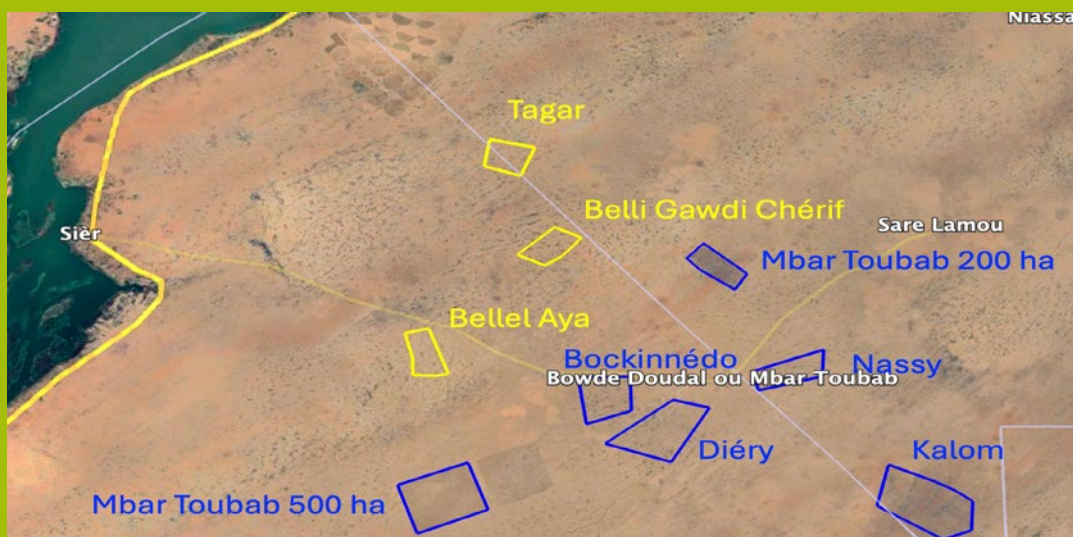
To spur economic development, Lignaverda facilitates access to loans for initiatives such as irrigated horticulture or solar-based pumps for water resource access. To this end, in 2024, Lignaverda strengthened ties with Entrepreneurs for Entrepreneurs (OvO), a Belgian non-profit organisation, with expertise in stimulating rural entrepreneurship in various African countries. This led to the creation of a first Lignaverda – OvO horticultural garden in the reforested site of Diéry, Syer. Under guidance of the Senegalese [Association pour la Promotion de l'Agroforesterie et de la Foresterie \(APAF\)](#), a 1-ha horticultural garden was installed in between the reforested trees. Additional shade (Citrus spp.) and nitrogen fertilizing tree (*Acacia* spp.) seedlings obtained from nurseries, were planted as well. Irrigation is done from 4 basins of 10 m³ each that are supplied with water from a pipeline connected to the nearby (4 km) borehole of Mbar Toubab. The plot was sown in October 2024. The first crops (okra, paprika, onion and tomato) were harvested in January 2025.

Carbon certification and beyond

Alongside field activities, the Senegalese team is focusing considerable effort on finalising the **Project Design Document (PDD)** required for carbon certification under VERRA's VM0047 and CCB labels. Our PDD is expected to be ready by July 2025 to enable project listing under both certifications. This process includes developing a robust baseline covering both carbon and socio-economic indicators.

To support this, several surveys and assessments will be conducted throughout the year:

- A **socio-economic baseline survey** will capture data on household conditions, community governance, and natural resource management practices among project participants.
- **Soil organic carbon (SOC)** will be measured through systematic soil sampling and laboratory analysis. SOC is a critical component of total project carbon, and in some models, it accounts for nearly half of the carbon sequestered.
- **Forest inventories** will quantify standing biomass and assess biodiversity. Using allometric equations, tree measurements in sample plots will be converted into biomass estimates to feed into the carbon modelling process.

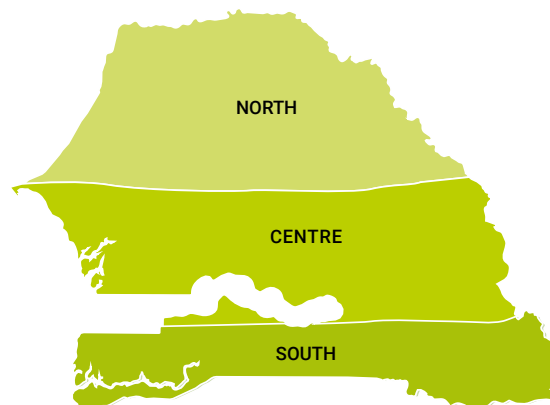


New 2025 sites (yellow) relative to previously reforested sites in Syer community (blue).



Expansion to protected forests (starting 2026)

Landscape degradation in Senegal is not limited to the Great Green Wall zone. In more humid parts of the country further south, several **protected forests** (*Forêts Classées*) have deteriorated to the point where active reforestation is required for them to retain their legal protected status. Starting in 2026, and contingent upon the Government of Senegal's approval of Lignaverda's **carbon-certified PDD**, restoration will begin in these high-priority areas in close collaboration with the Senegalese Directorate of Water, Forests, Hunting and Soil Conservation.



While degradation affects protected forests across the country, Lignaverda will initially focus on the northern Louga region, where the ecological need is greatest. In severely degraded forests such as Mpal, Ndioum Diéri, and Keur Mbaye, the **Vallerani technique** – a method based on direct sowing – will be deployed. This approach is particularly well-suited to dry zones and has proven effective in Lignaverda's projects to date.

In contrast, the Thailo protected forest presents a different set of conditions. Located near the Senegal River, it has evolved into a semi-permanent marsh due to recurring flood events. These moist conditions alleviate drought stress, allowing for the use of nursery-grown tree seedlings. This not only increases species survival but also significantly accelerates forest regeneration in the area.

By bringing degraded protected forests back to life, Lignaverda aims to extend its impact beyond the Great Green Wall – restoring ecological integrity and generating carbon, biodiversity, and socio-economic benefits across broader landscapes in Senegal.



Our projects

The FICAP project

The Flemish Government granted a subsidy to the capacity building project 'Let's make the desert Green' of Lignaverda, which is executed in the framework of the government's International G-STIC Climate Action Programme (FICAP).

The project will significantly enhance capacity building of Forest Management Committees (FMCs) that manage sowing, irrigation, crop protection and harvesting of horticultural crops within the reforested areas. Together with APAF, rolling funds are established from which local farmers can borrow to set up agroforestry activities of which the revenues will be used to repay the loans. Participating farmers will be trained in good agroforestry and agricultural practices, microcredit systems, marketing and environmental protection. In 2025 a new borehole will be installed in Diéry to extend the prevailing horticultural project from 1 to 5 ha. Horticultural produce (fruits, cereals and vegetables) will be sold on local and regional markets, thus providing income to the communities. This is urgently required because for them to be real custodians of new forests in their region, their most urgent needs (food security, health care) need to be addressed first. By linking socio-economic impact to reforested areas from the moment reforestation activities are implemented, we are securing buy-in of the Senegalese communities in semi-arid areas for long-term, sustainable forest protection.

As future agroforestry projects will predominantly be rainfed, forecasting future precipitation patterns is crucial. FICAP project partner VITO, therefore installed weather stations on 4 sites in Syer and Labgar communities. These stations collect critical climate data, which complement and feed into VITO's seasonal forecasting and long-term climate projections with CLIMTAG. By improving weather predictions, this technology empowers farmers to anticipate the start of the rainy season, optimize sowing schedules, and increase crop yields – strengthening food security in vulnerable regions. Additionally, high-precision climate data help Lignaverda analyse precipitation variability in the Sahel, enabling a data-driven reforestation strategy that maximizes survival rates and ecological impact.

By addressing these socio-economic challenges holistically, Lignaverda's program not only safeguards forests but also empowers communities, fostering resilience and sustainable development in the Senegalese landscape.



Namibia

A royal year for landscape restoration

In the framework of his visit to Namibia (29 April – 3 May 2024), [H.R.M. King Philippe of Belgium](#) accompanied by **His Excellency Nangolo Mbumba**, then President of Namibia, was introduced to Lignaverda's landscape restoration mission during a photo exhibition at the **Namibian State House in Windhoek**. The exhibition offered a visual journey through Lignaverda's reforestation work – showcasing the transformation of barren landscapes into vibrant ecosystems and highlighting the role of empowered communities in driving this change.

During this landmark visit, a **Memorandum of Understanding (MoU)** was signed between Lignaverda and the Namibian government, marking a formal partnership to combat desertification, restore degraded land, and promote biodiversity. This collaboration underlines our shared commitment to building a greener, more sustainable future through responsible environmental stewardship and inclusive development.



H.R.M. King Philippe of Belgium and H.E. Nangolo Mbumba receive a symbolic Golden Medal from Lignaverda's General Director, Werner Sels, in celebration of the MoU between Lignaverda and the Government of Namibia.



Signing by Werner Sels, General Director of Lignaverda and Mr. Teofilus Nghitila, Executive Director of the Namibian Ministry of Environment, Forestry and Tourism (MEFT), of the MoU between both parties on landscape restoration in Namibia.

Our projects

In line with the MoU, Lignaverda launched its first reforestation trial at **Siya**, a MEFT orchard located approximately 35 km west of Rundu in the Kavango West Region of northern Namibia. A total of **32 hectares** have been reforested through the installation of four **experimental plots of 8 ha each**, designed to test various techniques for sustainable land restoration.

The first two plots combine indigenous, drought-resistant tree species – such as *Berchemia discolor*, *Albizia versicolor*, *Trichillia emetica*, *Garcinia livingstonei*, *Diospyros mespiliformis*, and *Guibourtia coleosperma* – with high-value fruit tree species, including early- and late-maturing varieties of citrus, mango, avocado, and guava. This enables us to investigate the optimum tree species composition to establish a self-sustaining forest that requires minimal irrigation in advanced growth stages (after 5 years).

Within these plots, we are also testing the effects of **biochar and enhanced weathering of silicates** on soil fertility and carbon capture. Silicates, sourced as by-products from the Namibian mining industry,

are combined with biochar made from **invasive species such as** *Acacia mellifera* (blackthorn). This method not only enhances soil structure but also sequesters additional CO₂ in the soil beyond what is captured by the growing trees. The entire experiment is being conducted under the scientific leadership of the **University of Antwerp**.

For the early stages of the experiment, water is supplied from a borehole installed on-site. The third plot explores **Assisted natural regeneration (ANR)** by protecting severely degraded land and allowing natural vegetation to recover under full protection. The fourth plot tests **direct sowing**, replicating the successful reforestation model developed by Lignaverda in Senegal. To support this, Lignaverda, in close collaboration with the MEFT, has collected seeds from 20 indigenous tree species across Community Forests in the Kavango East and West regions.

The Siya trials serve as a **proof-of-concept**, providing essential data and practical insights that will inform the design and rollout of larger-scale landscape restoration projects across Namibia.

Partnering with communities in the North

Beyond experimental trials, Lignaverda is building long-term partnerships with communities in the **Kavango and Owambo regions**. In collaboration with **Traditional Authorities**, Lignaverda will formalise agreements to restore degraded **communal lands** – working hand in hand with the people who depend on these landscapes.

Our vision in Namibia is clear: to create forests *with* communities and *for* communities. By aligning climate action with socio-economic development, we aim to establish large-scale **agroforestry systems** that generate local income, strengthen food security, and create climate-resilient rural economies. In this way, reforestation becomes not only an environmental necessity but a vehicle for inclusive, sustainable growth.

Research & innovation



Lignaverda's activities centre on nature- and science-based solutions. We therefore work in close collaboration with academic partners to ensure that we work with state-of-the-art technologies and that our reforestation strategies are effectively reaching their goals. Collaborations include those with:

An **Academic Chair** at KU Leuven, which funds a four-year study focused on AI technology. Under the leadership of **Prof. dr. ir. Stef Lhermitte (KU Leuven)**, this initiative will enable monitoring of young forests in greater detail, tracking the number of trees, identifying species, and assessing overall biodiversity. This project is an important step toward using cutting-edge technology to improve the management and monitoring of our reforestation efforts.

The research group of **Prof. Ivan Janssens (Biology Department, Antwerp University)** who works on soil restoration, amongst others, including enhanced weathering. The latter relies on the addition of weathering silicates together with biochar on degraded soils. The silicates release calcium and magnesium to the soil while capturing carbon dioxide in the process. At the same time, the biochar enhances soil water retention and nutrient exchange capacity which both increase the capacity of the soil to sustain crops and trees. An enhanced weathering experiment is being set up in Siya, Namibia.

Em. prof. dr. ir. Patrick Van Damme from the **Department of Plants and Crops (Ghent University)**, who is currently dean at the **Faculty of Tropical AgriScience (Czech Life Sciences University Prague)**. Prof. Van Damme has a lifelong experience in the agro-ecology of semi-arid areas, has evaluated FAO's Action Against Desertification (AAD) program and is a regular consultant to Lignaverda's projects.

ArgusVision, a drone imaging company who pioneered with Lignaverda on the development of a tree monitoring system for young trees (1 to 5 years after sowing). In parallel with the KUL Academic Chair, Argusvision assists Lignaverda to transparently report tree survival rates from the very beginning of the reforestation project.



Our impacts

ECOLOGICAL IMPACT

Carbon sequestration | 70 to 100 tCO₂eq per ha (including soil organic carbon) over project lifetime. (SDG6)

Aquifer recharging | the half-moons created through the Vallerani technique collect 300,000 L of water per ha per year (at a density of 250 half-moons per ha). Because of improved soil permeability resulting from the creation of these half-moons, this water is replenishing the aquifers, enhancing the opportunities for tree taproots to reach these aquifers and use them as a water source as well as making drinking water more available to local communities. (Long term impact) (SDG6)

Soil restoration | trees reduce evaporation through shading; as a result, a microclimate is created allowing for the development of soil fauna and flora, which together with the continuous soil addition of organic material through litter fall and root decay, enhance soil structure and fertility. (Long term impact) (SDG15)

Biodiversity | particularly of subsoil fauna and mesofauna such as ants, termites, and larger animals such as birds, the Sulcata tortoise (a threatened animal), rabbits, hares, and small rodents, will increase as a result of reforestation. (Long term impact) (SDG15)

SOCIAL IMPACT

Reduction of nomadism | increased employment and revenues from community forests reduces villagers' need for transhumant migration and thus secures livelihoods more sustainably. (SDG8, SDG10, SDG11)

Gender equality | Lignaverda creates employment for women and young adults. Revenues of grass and NTFP sales are made directly available to women, making use of digital (e.g. Orange) money which is directly transferred to women's smartphones. This provides them with the resources to improve their own and their families' livelihoods. (SDG5)

Training and capacity building | through the community forest approach, Lignaverda continuously trains community members on soil and agroforestry management. (SDG4, SDG17)

Increased schooling degree | families' increased revenues allow more children to attend school. (SDG4)

Conflict prevention | Lignaverda creates structures and facilitates agreements between sedentary farmers and pastoralists so that economic activities (crop production and cattle herding) are reconciled and therefore food security of, as well as peace between these groups is guaranteed. (Long term impact) (SDG16)

Community collaboration | Lignaverda's community approach stimulates collaboration for forest protection and management between villages that otherwise compete for scarce natural resources. (SDG17)



ECONOMIC IMPACT

The reforested areas in the Sahel are fenced off to prevent nomadic cattle from browsing young trees. An added advantage is the **regrowth of grass**, which local communities can harvest and sell to nomadic cattle herders as a fodder (currently at +/- € 8 per ha), particularly at the end of the dry season (May-June). (SDG8)

Harvest and sales of **non-timber forest products** (NTFPs), such as Gum Arabic from *Acacia senegal*, or *Ziziphus mauritiana* or *Balanites aegyptiaca* oil). At peak years, Gum Arabic can yield up to € 1500 per ha per year. Trees will yield first NTFP products after about 5 years after sowing. (Long term impact) (SDG8, SDG9)

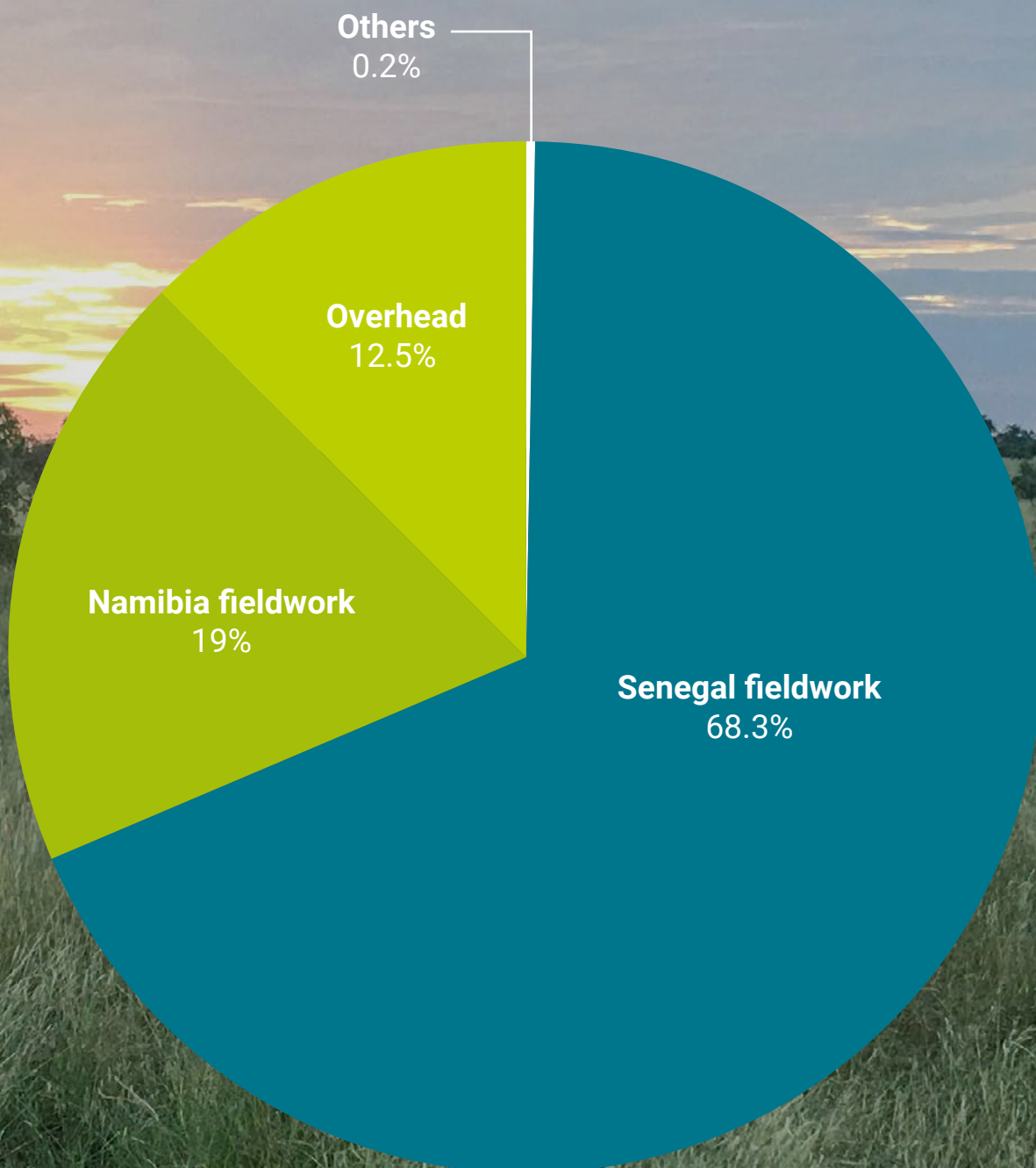
Agroforestry | Lignaverda establishes silvopastoral systems (i.e., combining trees with (fodder) grass, see above); eventually, these systems will develop into agrosilvopastoral systems in which, apart from grass, and thanks to the shade provided by trees, small horticultural crops (sorghum, millets, beans, maize, etc.) can be produced. (Long term impact) (SDG1, SDG2, SDG8, SDG9).

IMPACT MEASUREMENT

- ▶ **Tree survival rates** | using direct sowing as a reforestation technique entails uncertainties on the final number of seeds that germinate and develop into tree seedlings. Furthermore, the harsh, dry conditions are a continues threat to tree survival in the subsequent dry seasons. We combine manual tree counts with drone imaging to report on tree survival rates.
- ▶ **Carbon Sequestration** | trees take CO₂ from the atmosphere and store the carbon in their trunks. Satellite imagery and allometric models trained on data collected on the ground provide reliable estimates of the carbon sequestration rates of Lignaverda's forests. We report on these data at the issuance of carbon certificates in which each certificate represents one tonne of carbon sequestered.
- ▶ **Socio-economic impact** | is measured on annually in newly reforested areas where we carefully monitor the remunerations paid for seed and manure collection, sowing, participation to fence construction and field guarding. At the same time, we collect a basic set of socio-economic indicators (including schooling degree, livelihood assets and health indicators) which will be evaluated and reported every five years. To conclude with, cost-benefit analyses are performed of every socio-economic project which is developed with support from Lignaverda and its partner Entrepreneurs for Entrepreneurs (OvO). This also includes the annual sales of grass from within the reforested plots which is governed by the respective Forest Management Committees which are set up for each reforestation project and which consists of representatives of the villages surrounding the plots.
- ▶ **Ecological impact beyond carbon** | trees not only store carbon, but they also create micro-environments with increased biodiversity and soil quality. Lignaverda will report on each plot after 5 and 10 years the change in animal and plant biodiversity as well as in soil parameters (with a focus on soil organic carbon and nitrogen content).

Finance

2024 expense breakdown



These figures have been independently audited and verified for accuracy.

Partners

Long-term partnerships are central to Lignaverda's mission. Since 2012, we have proudly held accreditation from the United Nations Convention to Combat Desertification (**UNCCD**), reflecting our commitment to restoring degraded land, promoting sustainable land management, and alleviating poverty particularly in drought-affected regions of Africa.

We collaborate closely with leading academic institutions including **Ghent University**, the **University of Antwerp** and **KU Leuven**, where a recently inaugurated Academic Chair supports our mission. These partnerships underpin scientific research, field trials, and expert guidance, strengthening the evidence base and long-term impact of our work.

In the Sahel, home to the Great Green Wall initiative, environmental conditions are extremely challenging, with only 200–400 mm of annual rainfall concentrated in a three-month period. Since 2019, Lignaverda works in close partnership with the Senegalese Agency for Reforestation of the Great Green Wall (**ASERGMV**), ensuring our efforts are **legally**

acknowledged and **internationally accredited**.

In Senegal, we collaborate with **REACH**, a trusted local partner assisting us in applying the Vallerani water harvesting technique which is essential to the success of our reforestation efforts. Their expertise plays a critical role in enhancing tree survival rates and long-term ecosystem resilience.

Thanks to the support of the Flemish International Climate Action Programme (FICAP), we are expanding reforestation partnerships in Senegal. With **Ondernemers voor Ondernemers (OvO)**, we are developing agroforestry models that integrate **horticulture within our reforested zones**, offering communities additional sources of food and income and building capacity to communities to implement agroforestry systems in the future forests. **VITO** has installed **state-of-the-art weather stations**, which will significantly improve our ability to monitor microclimatic conditions and guide climate-smart interventions on the ground.

To ensure that our carbon projects

meet the highest international standards, we are working with carbon consultants of **Hamerkop**. Together with Hamerkop, baseline studies and project reports are prepared to draft a **Project Design Document (PDD)** – an essential component of carbon certification, ensuring credibility, traceability, and long-term value of our carbon credits.

In Namibia, we are strengthening our network through new partnerships with the Ministry of Environment, Forestry and Tourism (**MEFT**). These strategic collaborations provide essential institutional support for our reforestation projects in the region.

Transparency and accountability remain at the core of our operations. We work closely with **Finvision** for thorough financial and operational audits. In addition, our partnership with **ArgusVision** enables the use of high-resolution drone and satellite imagery to ensure accurate, verifiable reporting. These efforts reinforce our credibility and enable independent audits, essential for the integrity and trustworthiness of our carbon credit issuance process.



Team & governance

Meet some of our team



Werner Sels
Founder and CEO



Wouter Vanhove
Operational Director



Andy Martinez Lopez
Growth Director



Kris Vermeiren
Partnerships Manager



Ann De Beul
Administration



Selma Nasheya
Namibia Country Lead



Farba Gaye
Senegal Country Lead



Bineta Kamara
Socio-economic activities



Saïdou Ba
Agronomist



Patrick Hilger
Agronomist



Barry Yaya
Senegal logistics



Ami Diene
Administration



Atanasius Rumeta
Nursery



Patrick DeMilt
Local advisor



Patrick Van Damme
Academic Advisor and Prof in Tropical Agronomy



Daan Degroote
Image/Video professional



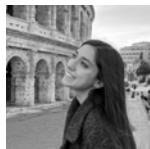
Tom Adriaensen
Design professional



Joris Debonnet
IT professional



Mathieu Van Belleghem
Strategy analyst intern



Silvia Artero Fullana
Doctor volunteer

Meet our board members



Steven Buyse
Chairman Lignaverda



Pol Deturck



Luc De Temmerman



Samira Bersoul



Stef Van Uffel



Marc Franck



Elodie Seys



Werner Sels

The road ahead

To increase impact on the ground, our operations in Senegal will integrate **smart weather stations** that support climate-resilient agriculture. These stations will enable local farmers and forest management committees to make better decisions on planting, harvesting, and resource use, thus increasing yields and strengthening long-term forest stewardship.

In 2025, Lignaverda will continue to **expand its footprint in Senegal**, surpassing **6,500+ hectares of restored land** – the equivalent to **10,000+ football fields**. This growth is not just a measure of scale but a reflection of our ability to deliver high-integrity, community-led climate impact in one of the world's most vulnerable regions.

At the heart of our approach is the belief that **forests and communities must grow together**. Forests cannot thrive without people – and people cannot thrive without healthy, functioning landscapes. That is why every Lignaverda project includes a robust **socio-economic component**, ensuring that local communities not only participate in the restoration process, but take full ownership of the forests they help grow, manage, and protect.



Looking further ahead, Lignaverda has set a clear ambition: to establish **at least 5,000 hectares of forests each year**. Two third of this will take place in Senegal, where our work contributes to the African Union's **Great Green Wall** initiative. The rest will be implemented in **Namibia**, where reforestation rates will steadily scale as operational capacity increases.

As we move forward, our vision remains grounded in simplicity and integrity: to regenerate degraded land at scale, to build sustainable livelihoods in the process, and to ensure that the forests we restore today are protected by the people who depend on them, for generations to come.

To support this model at scale, we will complete the **validation process** to register our Senegalese reforestation project under **VERRA's VM0047** and **Climate, Community & Biodiversity (CCB)** standards. These two globally recognised methodologies anchor our work in third-party-verified quality and transparency, ensuring that both climate and community benefits are measurable and auditable.

To diversify our reforestation models and manage exposure to localised risks, we will also begin **expanding into new regions**. Future growth will prioritise **semi-arid ecosystems**, which are exposed to desertification but are nevertheless often overlooked by project developers. Feasibility assessments will begin in **Spain** and **South Africa**.





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