lignaverda®

driven by ENTREPRENEURS WITHOUT FRONTIERS

ANNUAL REPORT 2023

lignaverda®

driven by ⬡ ENTREPRENEURS WITHOUT FRONTIERS

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Foreword

At **Lignaverda** (driven by Entrepreneurs Without Frontiers), we stand as pioneers in landscape restoration projects in semi-arid areas like the Sahel, directed by our unwavering commitment to addressing one of the greatest challenges of our time: **climate disruption**. Our vision is rooted in catalysing positive change for both humanity and the environment, heralding a new era of leadership anchored in idealism and collaboration. With operations spanning Belgium, Senegal, and Namibia, Lignaverda proudly operates as a **non-profit organisation** (NPO), dedicated to shaping a more sustainable world.

At Lignaverda, we take full ownership of our operations, from securing funding to delivering impactful results. This hands-on approach guarantees that the bulk of our financial resources directly benefit those who need them most. By investing in developing biodiverse high-value forests with socio-economic benefits through Lignaverda, **you are investing in a world where positive change takes precedence over monetary gain**.

Since 2022, we have dedicated ourselves to fortifying our organisation, with 2023 being marked by significant structural enhancements. A key milestone was Lignaverda's transition to an **international NPO by Royal Decree**. Throughout 2023, our focus was on refining internal structures, streamlining procedures, and modernizing our communication strategies. Notable achievements include the introduction of the **Lignaverda brand** and the development of dashboards to monitor key financial and operational aspects. Operationally, we have made significant strides towards **carbon certification** of our forest projects, underlining our commitment to operational transparency and long-term accountability. Moreover, our investments in the **development of cutting-edge AI technologies** like remote sensing with drones and satellite imagery **will allow us to report accurately in the future on reforestation projects**, aligning seamlessly with new EU legislation against greenwashing.

As part of our due diligence, we conduct **comprehensive risk assessments** before embarking on reforestation projects. To mitigate drought risks, we employ innovative techniques like the Vallerani method, which optimises rainwater for seed growth. Additionally, fencing is strategically implemented to safeguard seedlings from cattle, while fostering **community ownership and stakeholder involvement** ensures sustainability and consent. Fundamentally, we engage locals in nature-based initiatives at every stage of the process, preparing them for the forthcoming long-term accountability and benefits.

> At Lignaverda, we pioneer landscape restoration in semi-arid regions, catalyzing positive change for humanity and the environment through hands-on ownership and strategic partnerships, shaping a future where accountability and community empowerment thrive.

- In **Namibia**, we forged **partnerships with the Namibian government** to develop forests on community land, with trial gardens established in Siya in collaboration with **local authorities** and **universities** (including the University of Namibia and the University of Antwerp). As of 2024, large-scale landscape restoration projects are also planned in regions of Otjozondjupa and Oshikoto – more to the South of the country.
- In **Senegal**, Lignaverda has made remarkable progress, with a total of 4,232 hectares fenced by the end of 2023, of which **3,732 hectares** of new forests were already sown. Looking ahead, we have identified new plots totalling 2,140 hectares for reforestation in 2024, bringing the total to **6,372**

hectares (or 7.8 times the size of Manhattan). Through collaborative efforts with local villages, strategic investments in fencing, and the implementation of socio-economic impact programs aimed at swiftly transferring project ownership to local inhabitants, Lignaverda remains steadfast in ensuring the **long-lasting protection of these invaluable forest ecosystems**. Since this year, Lignaverda is bringing several innovations in Senegal, such as the installation of *boulis* for horticulture and weather stations for on-demand agriculture. As such, Lignaverda expands its socio-economic impact to ensure forest projects are truly sustainable, which distinguishes us from mere tree-planting organisations (TPOs).

As a result of its strong focus on community development and long-term survival of forests, Lignaverda is transitioning from a traditional TPO to a "**community-focused climate organisation**" with a robust scientific foundation. In addition to landscape restoration we are also investing in obtaining a Standard for carbon credits, remote sensing monitoring, and other functions to offer that track record. Our aim is to establish Lignaverda as an organisation with a quality brand that transparently communicates its achievements with audited KPIs and strives to take a leading role as a climate organisation that truly makes a difference.

I extend heartfelt appreciation to all who have contributed to our journey.

Werner Sels,
Founder of Lignaverda
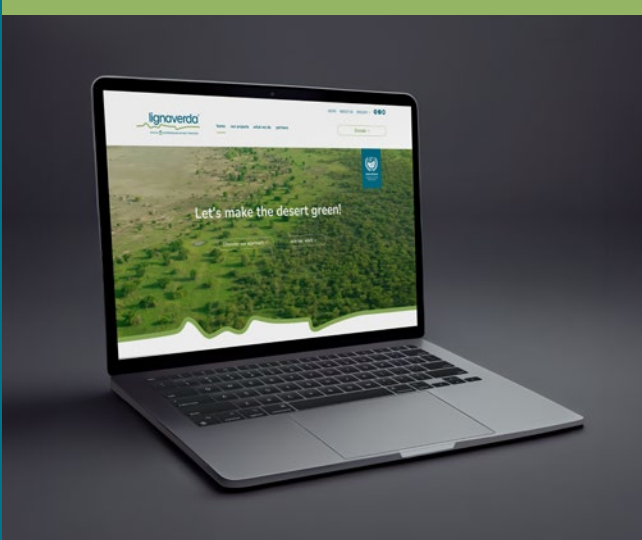
Rebranding to Lignaverda

2007, Entrepreneurs Without Frontiers (EWF) was founded under the name Ondernemers Zonder Grenzen (OZG). Given the international nature of the organization, both English and French names, Entrepreneurs Without Frontiers (EWF) and Entrepreneurs Sans Frontières (ESF) respectively, were used in communication. To convey our message clearly to the public, a single clear name was chosen for the organization: Lignaverda. This name refers to the green line, symbolizing the green walls we aim to build in Africa.

Entrepreneurship remains at the core, intricately woven into the DNA of the organization. Alongside the name change, the style and website were updated to reflect this evolution.

The Lignaverda logo refers to the Great Green Walls in Africa.

Key numbers

SINCE 2019

KPI	By end of 2022	Delta	By end of 2023	Delta [2]	By end of 2024
	Actuals			Estimated	
Hectares restoring	1,970	(+2,312)	4,282	+2,205	6,487
Expected number of trees reaching maturity [1]	591,000	(+693,600)	1,284,600	(+661,500)	1,946,100
Lifetime tCO_2 capture [3]	197,000	(+231,200)	428,200	(+220,500)	648,700
People benefiting	5,201	(+14,040)	19,241	(+9,908)[4]	29,149
Villages involved	28	(+54)	82	(+42)[4]	124
Communities involved	2	(+1)	3	(+3)	6

Note: The table refers to all projects across Senegal and Namibia since 2019 (excl. Burkina Faso).

[1] Average number of trees reaching maturity: 300 trees/ha. Preliminary estimates and academic research show an average of 300 trees reaching maturity with the Vallerani technique. This initial figure will be refined with advancements in drone and satellite monitoring technologies that Lignaverda is deploying, enhancing the transparency and accuracy of our data on mature long-lasting trees.

[2] These projections are based on the land that has been secured and the budgets set for 2024. Notably, ploughing of most designated plots has commenced as of the publication date of this annual report 2023.

[3] Lifetime carbon sequestration per hectare in semi-arid regions is estimated between 70-130 tons of CO_2, based on ongoing research. A conservative average of 100 tons of CO_2 per hectare is deemed reasonable pending verification from the inaugural third-party audit.

[4] These 2024 estimates are based on 2023 metrics which were extrapolated according to the planned hectare coverage for 2024. Data collection to refine these numbers is currently conducted by our local teams, and updates will be incorporated into the annual report upon completion of data gathering.

SINCE CREATION (2008)

Hectares restoring	16,487
Mature trees growing [1]	4,946,100
Lifetime tCO_2 capture [3]	1,648,700

Note: The table refers to all projects across Burkina Faso, Senegal and Namibia since Lignaverda's creation.

What makes Lignaverda unique

In 2023, Lignaverda has continued to stand out through its people-centric approach, commitment to innovation, and strategic partnerships. By prioritizing the needs of local communities, embracing innovative technologies, and fostering collaborations with academic institutions, Lignaverda drives sustainable change and contribute significantly to the global fight against climate change and environmental degradation.

1.

HOLISTIC APPROACH TO SUSTAINABILITY

Lignaverda goes well beyond mere tree planting, embracing a holistic approach aligned with the United Nations Sustainable Development Goals (SDGs). At Lignaverda, **we prioritise the needs of local communities**, ensuring that our initiatives not only tackle environmental concerns, but also address factors like food security, community development, and infrastructure improvement. This year in Senegal, 9,895 individuals from villages surroundings actively participated in tasks like soil preparation, seed collection, direct sowing, monitoring, and plot protection, thereby creating job opportunities for the ones that need it the most while supporting reforestation efforts.

2.

MORE THAN 15 YEARS OF REFORESTATION EXPERTISE IN SEMI-ARID AREAS

Since Lignaverda's 2007 pioneering days in Burkina Faso, Lignaverda has been specializing in semi-arid regions. Lignaverda is dedicated to tackling the distinct challenges and opportunities of these dry ecosystems, generally **overlooked by other organizations**. Our focused efforts aim to address the tangible vulnerability to climate change of these areas. Leveraging specialised techniques like the Vallerani method, which builds half-moon bunds to enhance rainfall retention and increase seed germination, we maximise the impact of our interventions. As such, we greatly contribute to ecosystem restoration and resilience.

3.

INTERNATIONAL NON-PROFIT STATUS

Lignaverda's International Non-Profit status, awarded by Royal Decree, sets it apart from other organisations. **Unlike for-profit counterparts**, Lignaverda's focus on local socio-economic benefits over financial gain reflects a commitment to long-term impact and transparency. This specific status necessitates adherence to stringent protocols, only gaining legal status upon receiving royal recognition.

4.

COMMITMENT TO INNOVATION & TRANSPARENCY

At Lignaverda, innovation, as well as data accuracy, and transparency are pillars of our operations. Throughout 2023, we continuously pursued innovative solutions to environmental challenges while upholding the utmost transparency in all our processes and outcomes. This commitment ensures long-term accountability and accuracy in everything we do. Finvision is our statutory auditor and their statutory auditor's report is unqualified and certifies that the financial statements for the year ended 31 December 2023 gives a true and fair view of the financial position and results of the company in accordance with the legal and regulatory dispositions.

In 2023, Lignaverda's people-centric innovation and strategic partnerships drove sustainable change in the global fight against climate change.

5.

GLOBAL ACCREDITATIONS

Lignaverda's special accreditation by the UNCCD (United Nations Convention to Combat Desertification) underscores its unwavering commitment to combating land degradation on an international scale. This special recognition not only validates Lignaverda's efforts but also reinforces its position as a key player in advancing SDG 15 and the agenda for Land Degradation Neutrality.

United Nations
Convention to Combat
Desertification

6.

STRATEGIC PARTNERSHIPS WITH LEADING UNIVERSITIES

Our collaborations with universities such as those of: Antwerp, Ghent, Leuven, Prague, and Namibia University of Science and Technology are integral to our on-the-ground success. These partnerships facilitate knowledge exchange, research collaboration, and capacity building, and enable us to leverage cutting-edge techniques and insights for high-quality restoration and reforestation projects.

7.

HARNESSING REMOTE SENSING TECHNOLOGY

By harnessing remote sensing technologies such as drones, satellites, and AI, we have unlocked the power to gather complete data that informs our conservation efforts. This data-driven approach empowers us to make informed decisions to achieve the best results in our landscape restoration and reforestation initiatives.

Our projects

1. BURKINA FASO | NORTH

In 2007, as a pioneering Belgian organization, we ventured into Burkina Faso's Sahel region. This coincided with the introduction of the Great Green Wall initiative by the African Union, aiming to combat desertification from Senegal to Djibouti due to climate change. After conducting a feasibility study, we initiated reforestation efforts in 2010, completing the projects by 2017 – a span of 8 years serving as a proof of concept. During this period, we reforested 10,000 hectares of land, fostering vision, methodology, and community engagement for sustainable outcomes.

Challenging political circumstances hindered our ability to continue working safely, leaving us with limited visibility on current site status. We aim to leverage modern technologies like satellite imagery in the future for remote assessments. Despite challenges, newly established forests continue to yield various market products, supporting local populations in their livelihoods – a testament to the socio-economic impacts of forest establishment in the short, medium, and long term. Lignaverda's approach distinguishes us from mere tree-planting organizations, as we prioritise holistic outcomes benefitting all stakeholders, in particular the local populations and environment alike.

As we navigate the complexities of the Sahel, our commitment to combatting desertification and promoting environmental conservation remains steadfast. Our experiences in Burkina Faso inspire us to seek innovative solutions, evident in our expansion to Senegal in 2018 and Namibia in 2023. In the year ahead, Lignaverda will continue leveraging expertise and partnerships to drive positive change, reaffirming our dedication to a sustainable and equitable future for all.
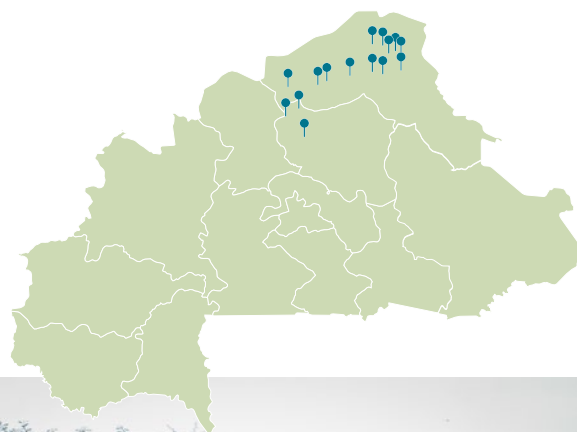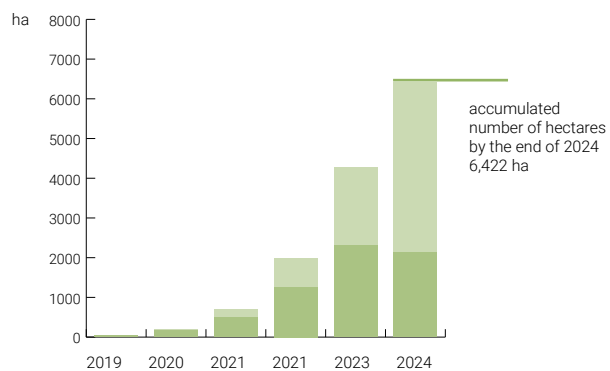
2. **SENEGAL** | GREAT GREEN WALL

In 2023, Lignaverda has reforested 1,525 hectares of degraded semi-arid land in Senegal's Great Green Wall region in just one year. A historic milestone. This remarkable accomplishment was achieved through the dedicated efforts of Lignaverda's Senegalese team, in collaboration with local communities and the Senegalese Great Green Wall Agency (ASERGMV).

Lignaverda is on track to restore a total of 6,422 hectares by the end of 2024 *(Graph 1)*. Specifically, in Syer, where 210 ha and 500 ha were previously restored in 2020 and 2021 respectively, an additional 600 ha were reforested in Wendou Delby, while 475 ha were restored in Diéry. Moreover, in Labgar (80 kilometres east of Syer), 450 ha of land were reforested in Gaydoum, and 550 ha in Loumboul Djiby were fenced off to be prepared for ploughing and sowing in 2024.

Lignaverda's reforestation efforts heavily rely on the involvement of nearby villages, engaging them in crucial tasks like seed and manure collection, sowing, short- to long-term plot protection and continuous monitoring. These activities are coordinated by newly established Community Forest Management Committees (CFMCs), aimed at long-term protection and sustainable exploitation of the growing biodiverse forests. By involving locals at every stage, Lignaverda's initiatives not only contribute to reforestation but also create inclusive job opportunities in economically underdeveloped areas, significantly impacted by climate disruption. Communities have been remunerated for their work in all previous projects, including those in Mbar Toubab (200 ha in 2019 and 2020), Syer (500 ha in 2021), Tessékéré (1,260 ha in 2022), and Wendou Delby, Diéry in Syer, and Gaydoum in Labgar (1,500 ha in 2023) *(Table 1)*. On top of that, per plot we employ 24 rangers per year for plot monitoring during several years after

Graph 1: Number of hectares per year (2019 – 2024)

accumulated number of hectares by the end of 2024 6,422 ha

sowing, thus creating recurring jobs. Except for these rangers, village participants to Lignaverda's reforestation projects are predominantly women (Table 2). This increases the probability that the reforestation income will be used for household expenditures so that they will finally benefit the entire population of the communities involved.

We contribute to biodiversity increase by working exclusively with native, drought-tolerant tree species that have been selected according to the preferences of the population. In 2023, 14 different tree species were sown, including various *Acacia* species (such as *A. senegal* from which the highly valued gum Arabic can be harvested), *Ziziphus mauritiana*, *Sclerocarya birrea*, *Balanites aegyptiaca* and *Faidherbia albida*.

Table 1: Remuneration of all communities for their work in all previous projects,

Year	Community	Site	ha	Perimeter	Villages	People
2019-2020	Syer	Mbar Toubab (160+50 ha Bowde Doudal)	210	6.150	4	790
2021	Syer	Mbar Toubab (les 5 villages	500	9.800	7	1.751
2022	Tessekéré	Aly Thierno	602	12.500	10	1.726
		Labardy	658	10.050	7	934
2023	Syer	Wendou Delby	600	102.000	7	1.975
		Diéry	475	9.500	8	2.553
	Labgar	Loumboul Djiby	550	9.515	17	4.145
		Ngaydoum	687	11.000	22	5.367
2024	Syer	Kalom	600	9.900		
		Nassy	240	7.000		
		Boackineddo	300	7.000		
	Mboula	Wendou Mouthiétéki	200	5.700		
		Wouro Séno	200	5.700		
		Boboral	200	5.700		
		Mbéloné Kaadié	200	5.700		
		Kodiolal	200	5.700		
		TOTAL	**6.422**	**131.115**	**82**	**19.241**

		Seed Collection	Manure Collection	Sowing
Wendou	♂	11	35	118
Delby	♀	120	96	291
Diéry	♂	9	54	124
	♀	95	96	94
Gaydoum	♂	11	62	154
	♀	35	57	101

People remunerated for 2023 reforestation activities in Wendou Delby, Diéry (Syer) and Gaydoum (Labgar)

We do not plant trees, we develop forests

is more than a slogan for Lignaverda. Creating biodiverse forests is a process which heavily relies on peoples' support. Rural people in Senegal are stuck in a poverty trap in which they continue to rely on livestock herding and unsustainable wood harvesting practices, leading to further landscape degradation, exacerbating the climate change effects (desertification) and further increasing poverty. Since the only income in the years between reforestation and a mature forest is derived from grass sales, there is a risk that people will open the fences, allow livestock to graze inside or even cut down the slowly growing trees for fuelwood.

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 CMFCs undergo rigorous training in self-organisation as well as forest management and protection. Through collaborative efforts, CFMC statutes are co-developed, and the financial and managerial literacy of committee members is bolstered.

Micro-Economic Entrepreneurship Training

Leveraging the unique opportunities presented by the semi-arid environment, Lignaverda supports various micro-economic ventures, guided by its slogan "We do not plant trees, we develop forests". These ventures include transforming *Balanites aegyptiaca* seed oil into soap, practicing sustainable harvesting of gum Arabic from *Acacia senegal* trees, converting cow dung and organic waste into fire bricks, and facilitating the harvest and the sale of honey from flower-rich environments.

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. In collaboration with Entrepreneurs for Entrepreneurs (OvO), a non-profit organisation, expertise gained from similar initiatives in the Senegalese Sahel is harnessed to maximise 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.

3. SENEGAL | PROTECTED FORESTS

Landscape degradation in Senegal unfortunately extends beyond the Great Green Wall (see previous section). More towards the South, in the slightly more humid areas of the country, a number of protected forests – Forêts Classées in French – have degraded to the extent that they require reforestation to maintain their classification as "protected forests". Starting next year, Lignaverda – in close collaboration with the Directory of Water and Forests, Hunting & Soil Conservation (DEFCCS) (governing body of the Senegalese protected forests) – will embark on a restoration effort across three key Senegalese regions.

NORTH

The **North** of Senegal, features a **very dry Sahelian climate**, receiving an average of just 340 mm of rainfall annually. Dominated by *Acacia* species and *Balanites aegyptiaca*, vegetation in this region faces degradation primarily from forest fires and browsing stray livestock. It is thus imperative to fence reforested land and create firebreaks post-rainy season to reduce the pressure on young seedlings. In heavily degraded protected forests (such as Mpal, Ndioum Diéri, and Keur Mbaye), the Vallerani technique – involving **direct sowing** – can be effective. Alternatively, in the Thailo protected forest that remains humid due to the nearby Senegal river having transformed it into a marsh, **planting nursery-raised trees** can alleviate drought stress issues generally faced by nursery seedlings.

CENTRE

The **Centre** – encompassing Fatick, Kaolack, and Kaffrine – boasts a **Soudano-Sahelian climate**, receiving an average annual rainfall of 624 mm, significantly more than the Northern Zone. This higher rainfall results in denser vegetation compared to the North. Reforestation efforts across these regions will target ten protected forests. Landscape degradation in the Centre is primarily driven by **salinization**, **tree cutting for charcoal production**, and **forest fires**. Unlike the North, stray livestock that pose a threat to young trees are virtually absent in this zone. To mitigate salt stress, we consider halophilic trees such as *Tamarix senegalensis*, *Parkinsonia acuelata*, or *Acacia seyal* species. Additionally, the establishment of **firebreaks** can be achieved through clearcutting corridors in forests or by introducing and planting fire-resistant species like *Anacardium occidentale* or *Euphorbia* species.

SOUTH

The **South** of Senegal include three prospected regions (Kolda, Sédhiou Tambacounda), characterised by a **dense vegetation** due to relatively high annual precipitation rates averaging 1000 mm. In this zone, ten classified forests are stated for reforestation efforts. Fires and tree cutting for charcoal production pose significant threats to the forests in the South. Additionally, **illegal cutting** and **trafficking of high-value hardwood** such as *Pterocarpsu erinaceus*, *Cordyla pinata*, *Bombax ceiba*, or *Afzelia africana* exacerbate forest degradation. The absence of clear signs indicating forest borders and protective status further contributes to this issue. To address these challenges, plots in the South will require clearer delineation, and the population will be **sensitized to unsustainable tree cutting activities**. A strategic plan will be developed to reintroduce vulnerable high-value species while mitigating the threats of illegal logging. Similar to reforestation efforts in the Centre, **firebreaks** will be established through clearcutting corridors in forests or by planting species like *Anacardium occidentale* (cashew) on strips several meters wide.

4. **NAMIBIA** | NORTHERN REGIONS

Namibia has witnessed significant deforestation in recent years due to human activities, including logging, agriculture, and charcoal production. These activities have led to soil erosion and the loss of biodiversity, negatively impacting rural communities that depend on forests for their livelihoods. Reforestation holds great potential for addressing these issues.

SIYA - Trial

Siya is an abandoned orchard, about 35 km west of Rundu in the West Kavango region where we set up a collaboration with the Namibian Ministry of Environment, Forestry and Tourism (MEFT). It consists of 4 experimental plots of 10 hectares each to test various strategies for sustainable landscape restoration. In the first, the reforestation potential of the direct sowing approach will be evaluated in the specific ecology of northeast Namibia. In a second plot, we will test combinations of local, drought-resistant tree species, in combination with useful fruit tree species, aiming for forest regeneration, dependent only from rainfed irrigation. The Namibian University of Science and Technology will guide the scientific evaluation of the latter experiment. In a third plot, the potential of Assisted Natural Regeneration (ANR) of fully protected degraded areas will be evaluated. The fourth plot will test enhanced weathering as a soil regeneration method. It consists of incorporating silicates (by-products from the local mining industry) and biochar (produced from invasive species such as the blackthorn, *Acacia mellifera*) into the soil, to improve soil structure and fertility, but also to sequester CO_2 in the soil in addition to the carbon captured by the trees. This experiment will be scientifically led by the University of Antwerp (Belgium). The Siya trials will culminate in a proof-of-concept on the basis of which more extensive landscape restoration projects will be carried out elsewhere in Namibia.

DIVUNDU – Pilot

In Divundu (East Kavango Region), Lignaverda will execute a pilot on 20 ha of land which is leased from a nearby blueberry (*Vaccinium* spp.) farm. Seedlings of both native trees as well as of commercially interesting fruit trees (avocado,
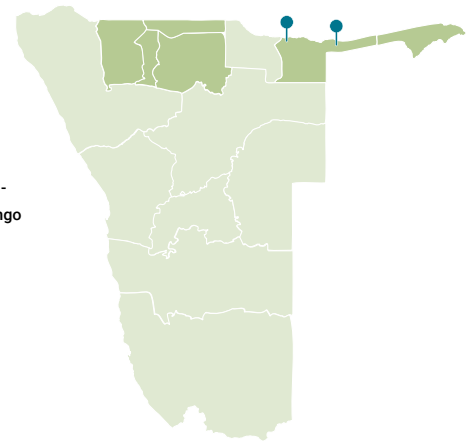
Regions of: Omusati - Oshana - Ohangwena - Oshikoto - Kavango East & West - Zambezi

citrus, guava, mango, etc.) will be planted. A drip irrigation system will kick-start tree growth during the first year. Irrigation will be removed from native trees and will continue on the commercially interesting fruit trees. The pilot is a proof of concept of an orchard that combines native trees and commercially interesting fruit trees which maximises carbon and economic benefits of reforested Namibian landscapes.

Working with communities in the north

Further, in Kavango as well as Owambo regions, Lignaverda will forge cooperation agreements with the Traditional Authorities and thus the communities under their rule, for reforestation of communal land. It is Lignaverda's vision and strategy, to create forests in collaboration with, and for the benefit of the communities. As a result, on communal land, Lignaverda will maximally connect climate and socio-economic objectives by, for example, developing a large-scale agroforestry system with the population.

5. **NAMIBIA** | OTJOZONDJUPA AND OSHIKOTO REGIONS

In the Otjozondjupa and southeast of the Oshikoto region, Lignaverda will undertake large-scale landscape restoration projects (4000 - 10,000 ha) on degraded grasslands obtained from private owners with whom Lignaverda will enter into a lease agreement.

The landscape restoration strategy will consist of

1. Removal, processing and recycling as biochar of invasive bush and tree species.

2. Reforestation according to the renowned Vallerani (water harvesting) technique as well as insights acquired in the pilot project in Siya.

3. Socio-economic activities such as agroforestry, ecotourism and wildlife conservation, which will involve local entrepreneurs and provide incentives for forest protection.
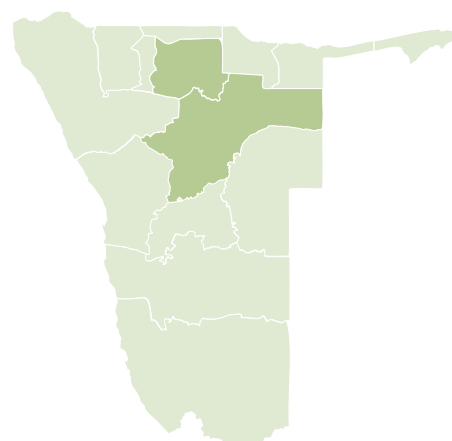
Expansion

Coming soon
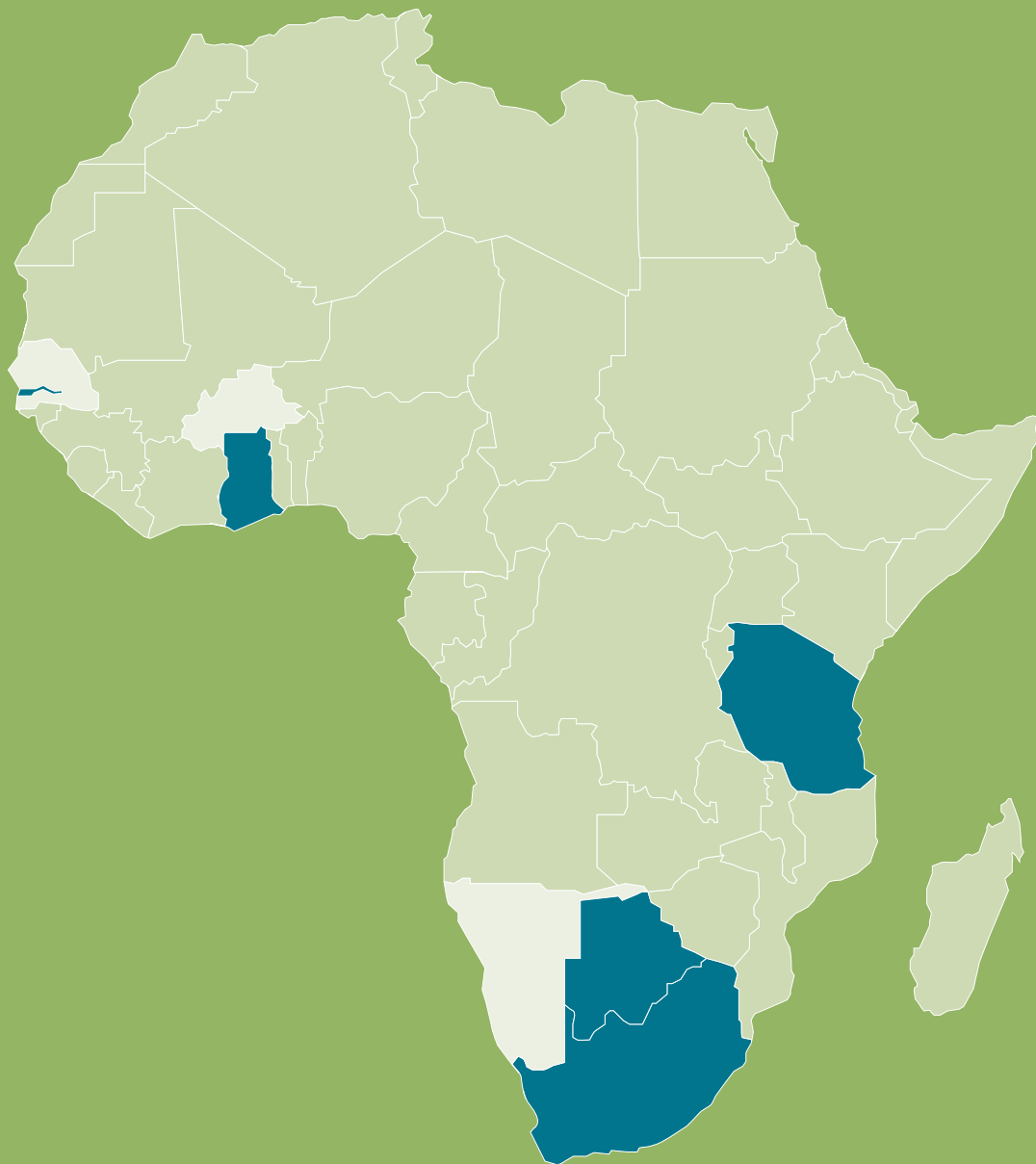
Our impacts

ECOLOGICAL IMPACT

Carbon sequestration | 70 to 100 tCO_2eq per ha (including soil organic carbon) over project lifetime. **SDG13**

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**

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**

SOCIAL IMPACT

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

Increased schooling degree | Families' increased revenues allow more children to attend school. **SDG4**

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

Reduction of nomadism | Increased employment and revenues from community forests reduces villagers' need for nomadism and thus secures livelihoods more sustainably. **SDG8, SDG10, SDG11**

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

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**

ECONOMIC IMPACT

Short-term crop yield | The afforested 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**

Long-term crop yield | 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**

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:

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.

Prof. Em. 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.

Prof. Vera De Cauwer from the Department of Natural Resource Sciences (Namibia University of Science and Technology, NUST), who specializes in natural resources management, biogeography, plant ecology, and tree breeding. Her experience in population dynamics and biomass and wood production potential of woody species are an asset to Lignaverda and guides our reforestation projects in Namibia.
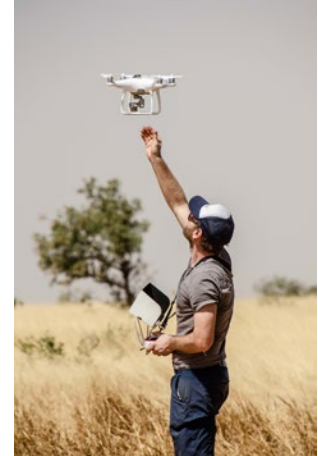
ArgusVision, a drone imaging company who partners with Lignaverda on the development of a tree monitoring system for young trees (1 to 5 years after sowing) which relies on drone imaginary and artificial intelligence (AI). The system will add information to canopy-based tree growth models that rely on satellite images. Drone imaging and tree evaluation assists Lignaverda to transparently report tree survival rates from the very beginning of the reforestation project.

Our services

Community-centric landscape restoration Lignaverda's primary activity and service is the restoration of degraded land through reforestation, with the goal of improving the livelihoods of those depending on this land. By using a range of local species and working at scale, we have a significant impact on biodiversity. Through our close collaboration with local communities, we foster their stewardship of these forests, and ensure the longevity of our positive ecological, social, and economic impact.

CORE

Community-centric landscape restoration

ADD-ONS

Sports challenge and gamification	Remote sensing monitoring	Carbon certification

Gamification: Keep Moving Challenge
The Keep Moving Challenge, in partnership with *Energylab*, is an opportunity for companies to engage as a workforce for the climate, combatting desertification. It consists of an exciting month-long challenge where Lignaverda plants trees for kilometres ran, swam, or cycled, and for volunteering hours recorded.

Remote sensing (ips): drone/satellite/ai
Lignaverda can now introduce an additional service to those engaging with our core landscape restoration activities, which is remote sensing. Leveraging cutting edge technology through drones, satellites, and AI imagery, Lignaverda can now offer even greater transparency to stakeholders interested in witnessing our real-time progress.

Carbon certification and accreditation
For companies seeking an environmentally and socially responsible investment, Lignaverda will soon be able to offer carbon credits due to its prestigious Gold Standard certification. These credits are generated through our core services which sequester carbon dioxide: reforestation and Biochar.

Finance

Cost structure

On-the-ground costs
68.2%

Overhead costs
17.1%

Other operating costs[1]
14.7%

+9.5%
revenue growth
(2022-2023)

+19.5%
per annum
(2021-2023)

[1] Including utilities, rent, insurance, marketing, office supplies,...

Partners

Partnerships

At the heart of our mission lies the importance of forging strong long-term partnerships to realise our goals. Since 2012, we have proudly held accreditation from the **UNCCD – United Nations Convention to Combat Desertification**, dedicated to combating desertification and drought effects, particularly in Africa. At Lignaverda, we aim to restore degraded lands to promote sustainable land management, as well as to alleviate poverty in affected areas. Additionally, we collaborate closely with prestigious universities such as **Ghent University, University of Antwerp, Czech University of Life Sciences Prague**, and **Namibia University of Science and Technology** for scientific studies, trials, and advisory purposes.

The Sahel region, which the Great Green Wall (see section A.2) traverses, presents numerous challenges due to its semi-arid nature and scant rainfall of 200-400 mm annually concentrated over 3 months only. We are the only Belgian non-profit engaged in the Great Green Wall initiative, collaborating closely with the **ASERGMV – Senegalese Agency for Reforestation of the Great Green Wall** – since 2019, ensuring our projects are legally valid and receive (inter)national recognition, accreditation, and protection. In Namibia, we are initiating partnerships with the **MEFT – Ministry of Environment, Forestry & Tourism**, **UN WFP** - **World Food Program** – and **EEAS – Delegation of the European Union**, pivotal endorsements for our reforestation endeavours.

Transparency in our financial and activity reporting is paramount, and we uphold this value through collaborations with trusted entities. Working closely with **Finvision** enables comprehensive financial and operational audits, ensuring our activities are transparent and accountable. In addition, partnerships with **ArgusVision** and **Genvision** provide cutting-edge drone and satellite imagery technology, enhancing the accuracy of our reporting. These initiatives not only bolster our credibility but also pave the way for independent audit during carbon credit issuance, underscoring our commitment to transparency and integrity in our operations.

Sponsors

We extend our heartfelt gratitude to our sponsors whose unwavering support has been instrumental in enabling Lignaverda to achieve its milestones thus far. It is through their generous contributions and steadfast belief in our mission that we have been able to make a meaningful impact in sustainable forestry and environmental conservation. We sincerely appreciate the trust they have placed in us and remain committed to delivering on our shared vision for a greener and more sustainable future.

CVC	TVH	G&V energy group	BAIN & COMPANY	sdworx	Rotary
Cooper CONSUMER HEALTH	httpool by Aleph	Aleph	FORTINO CAPITAL PARTNERS	Signpost the ICT partner for education	NOTAIRES BERQUIN NOTARISSEN
Flanders State of the Art	AGO JOBS & HR	dr.organic	RECTICEL	entrepreneurs for entrepreneurs Sustainable cooperation with Africa	ms MARIS STELLA INSTITUUT groeien naar morgen
GAMING¹	energy lab	umicore	GILEAD	axi	vito vision on technology
strada	Bank VanBreda	Nova Reperta MAP. MARK. MOVE.	Roularta Media Group	accenture	imec
amadys		VAN AERDE FOOD GROUP	antargaz	La Lorraine Met passie gebakken	finvision
WATERLEAU	belconfect SAFETY WORX- AND FOOTWEAR	cordeel group	Teamleader	QLM PLAY A BIGGER GAME	and more...

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
Adminstration

Zoé Belison
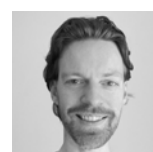Internal Volunteer

Patrick Demilt
Advisor

Patrick Van Damme
Academic Advisor and Prof in Tropical Agronomy

Daan Degroote
Image/Video professional

Tom Adriaensen
Design professional

Joris Debonnet
IT professional

Meet our board members

Steven Buyse
Chairman Lignaverda

Pol Deturck

Bob Verbeeck

Luc De Temmerman

Samira Bersoul

Frédéric Marquet

Stef Van Uffel

Tom Schepers

Marc Franck

Werner Sels

The road ahead

In the coming years, Lignaverda wants to build **at least 4,000 ha of community forests** on an annual basis. Half of this will be done in Senegal, where our efforts will contribute to fulfilling the Great Green Wall. The other half will be executed in Namibia, where Lignaverda's reforestation rates will gradually scale up.

Lignaverda's **socio-economic program** is the foundation of our reforestation projects. People do not thrive without forests, but forest conservation relies very heavily on community's wellbeing. We will add a socio-economic component to every reforestation project in both Namibia and Senegal to support communities in becoming true custodians the community forests Lignaverda helps them to grow, exploit and conserve.

Enhancing people's socio-economic situation is achieved sustainably when people do not solely depend on foreign donors but have enhanced their capacity to build livelihoods themselves. Therefore, at the core of our socio-economic program is the **stimulation of and capacity building for local (micro-) economic entrepreneurial activities** such as the harvest, transformation and sales of non-timber forest products (tree fruits) or dairy products. In the coming years, our collaboration with Entrepreneurs for Entrepreneurs (OvO) will be strengthened and extended to all our reforestation projects in Senegal and other countries.

To improve the number of reforestation options as well as to reduce risks, Lignaverda will **extend its activities to other countries**. In 2023, Namibia was a first step. In the near future, we will explore reforestation opportunities in other countries with a primary focus on Africa (e.g. Botswana), but also other continents will be considered. Because the semi-arid areas around the globe are the most vulnerable, we will continue to give priority to degraded land in these regions.

Carbon credits are the engine that drive Lignaverda forward. The carbon certificates produced by our projects are transferred to our sponsors which is a hard proof of their contribution to fighting climate change and an incentive for further investment in Lignaverda. We will certify all Lignaverda projects dating back to 2020 as well as our future reforestation projects.

lignaverda®

driven by ENTREPRENEURS WITHOUT FRONTIERS

www.lignaverda.org