JUSTDIGGIT

IMPACT REPORT

2022

INDEX

HERE IT IS: JUSTDIGGIT'S SECOND IMPACT REPORT!

The purpose of this report is to provide all insights from our data and research that could not be squeezed into our full annual report. We're proud to say that last year we, together with our partners, have taken important steps towards our mission: regreening Africa by inspiring and activating millions of subsistence farmers to restore their degraded lands.

In order to achieve our mission, we need to do more than just restore large areas of land. We also need to make sure that these areas are maintained and protected from new degradation. In all our landscape restoration programs on the ground, we closely collaborate with local partners, communities and other stakeholders. In the end, the only way we can sustainably regreen the planet is through the hearts and minds of people!

As we are celebrating Justdiggit's 10th anniversary this year, it's a good time to look back at the impact we have made thus far. In this impact report, we will give an overview of the growth of our programs and the successful scaling to new landscapes in the last few years. We are also proud to share the first insights into the longer-term sustainability of our results.

If you can't wait to see our results, you can check out our impact summary for a quick overview of the most important regreening metrics. If you're interested in taking a deeper dive into our regreening programs, our impact metrics and how we measure them, we encourage you to keep reading this impact report! We can already tell you that the area we are regreening and the number of people we are reaching has continued to grow last year. We've also seen good results when it comes to the recovery of vegetation in previously degraded landscapes and the continued engagement of the farmers and pastoralists we work with.

In this impact report, we only focus on the impact of our own programs. That's not all we are doing for the regreening of our planet, though! In order to scale up global land restoration efforts and create a grassroots regreening movement, we're also supporting other organisations who are restoring land. We call this Boosting Other Programs. And with our Moving Beyond Programs, we are working on ways for farmers and pastoralists to regreen their land without the need for our physical presence on the ground. A new mobile app is the most important building block for this program. As the implementation of these strategies is still in an early stage, we do not yet have much data to report. We are looking forward to reporting on this in the coming years!

2022: A YEAR OF DROUGHT

The success of our programs heavily rely on rainfall. Especially when it comes to rainwater harvesting. However, drought has been a consistent issue in 2022 in the landscapes in which we work. Millions of livelihoods have been affected and some areas were hit hard. Unfortunately, we have experienced the effects of drought firsthand, by finding countless animal carcasses, both from wildlife and livestock that died because of lack of food or water. In some areas, the situation was compared to the devastating drought of 2008, when reportedly half of the livestock in the larger Amboseli ecosystem died. The effect of the droughts on the communities is illustrated in this blog, written by Ishani Sonak, a master's student who conducted her thesis research in our program areas.

While the average amount of rainfall in the long term may not have changed much, things have become very unreliable in the past years. Sometimes there are entire rainy seasons without any rain, while at other times rainfall is so intense that it leads to floods. That's why our work has become even more important in times of drought, capturing the little rainfall and ensuring it can infiltrate the soil, instead of being washed away. The current situation stresses the importance of recovering sustainable, productive and climate-resilient farmland to secure livelihoods. We believe that the large-scale implementation of nature-based solutions plays an important role in this.

Unfortunately, the immediate success of our interventions – especially the water-harvesting interventions such as water bunds – heavily depends on rainfall. The same goes for the grass seed banks: they rely on rainfall to produce grass seeds and hay.

The grass seed banks in the Amboseli landscape have been affected by the drought. Although the women groups managing the grass seed banks were ready for the growing season, they did not manage to harvest any grasses due to the poor rains.
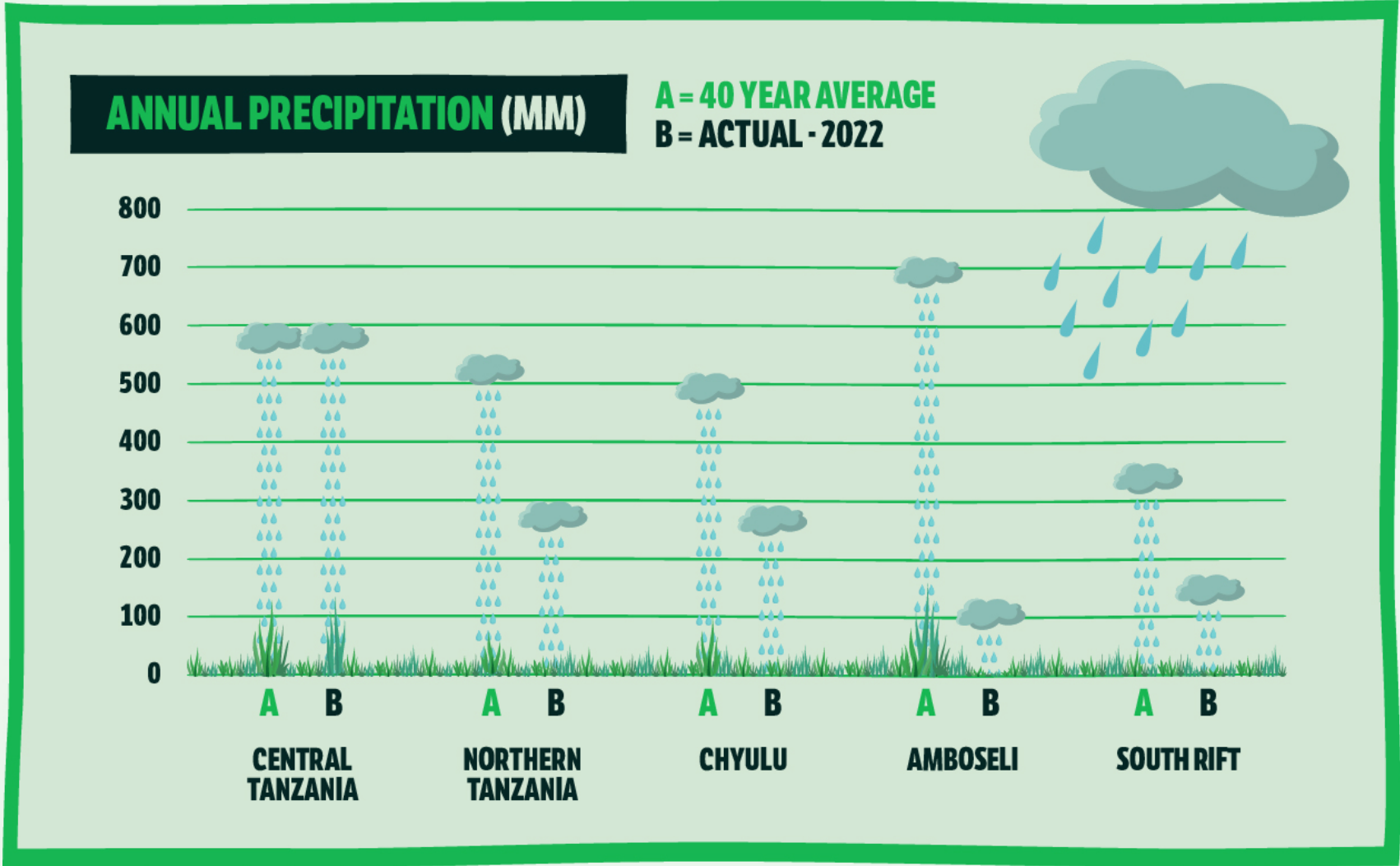
FIGURE 1: The 40-year average precipitation compared to actual precipitaiton in 2022.

Figure 1 shows the total amount of precipitation during 2022 and compares it to the 40-year average for each landscape we work in. It is clear that the landscapes in southern Kenya and northern Tanzania were heavily affected by the drought. At the time of writing, March 2023, these areas finally received some rain. We hope the rainfall will continue, as our projects and of course, the water and food security of thousands of people depend on it.

JUSTDIGGIT'S GLOBAL FACTS & FIGURES

1. JUSTDIGGIT'S GLOBAL FACTS & FIGURES

GEOGRAPHICAL SCOPE
WHAT WE DO & OUR PROJECT AREAS

In 2022, we've been active in five landscapes: Chyulu, South Rift and Amboseli in Kenya, and Northern Tanzania and Central Tanzania. As you can see on this map, we use different interventions depending on the area and terrain:

GENERAL LANDSCAPE OVERVIEW

KENYA

TANZANIA

- 🟨 CHYULU LANDSCAPE
- 🟥 SOUTH RIFT LANDSCAPE
- 🟩 CENTRAL TANZANIA LANDSCAPE
- 🟦 NORTHERN TANZANIA LANDSCAPE
- 🟧 AMBOSELI LANDSCAPE

FIGURE 2:   Map of project areas.

Water bunds: 🟨🟥🟩🟦🟧

Probably our most well-known regreening technique! Bunds are semi-circular shallow holes dug in the ground that capture rainwater and prevent erosion. They promote infiltration, allowing seeds to grow into vegetation and giving the soil a chance to restore.

Water trenches: 🟥🟩🟦

Also called fanya juu and fanya chini (means throw it upwards and throw it downwards in Swahili). Water trenches retain rainwater, reduce erosion and are often used on sloped farmlands, where regenerating trees might not reduce surface runoff enough. Water trenches are used on both farmland and rangeland.

Treecovery: 🟩🟦

Better known as Farmer Managed Natural Regeneration (FMNR) or kisiki hai (means living stump in Swahili). This is an effective method to regenerate trees. It involves the selection, pruning and protection of stumps of cut-down (but alive!) trees.

Grazing management: 🟩🟥🟦🟧

Restoration of degraded areas through controlled or restricted grazing, by promoting and improving grazing rules and bylaws. So called grazing reserves only allow grazing during certain parts of the year, while our physical intervention areas (such as bund plots) are restricted for grazing to allow these areas to restore.

Grass seed banks: 🟨🟦🟧

Small parts of communal land are used for the production of grasses and grass seeds. These areas are managed by Maasai women's groups, who sell the grass seeds on local markets or to regreening projects such as our bund plots for additional income.

We have two main types of regreening programs, focusing on respectively rangelands and farmlands. Within our projects, we select a combination of landscape restoration techniques that are most suited for the project area in close collaboration with our local partners. In general, these are the main type of activities:

1. Regreening rangelands by bringing back grasses (mainly in Kenya)
   a. Physical restoration, such as digging water bunds and trenches, to prevent further erosion and allow water to infiltrate the soil, bringing back vegetation
   b. Grazing management: restoration of degraded areas through the resting and protection of physical restoration areas such as bund sites
   c. Grass seed banks: producing grass seeds while providing an additional source of income

2. Regreening farmland by bringing back trees on the farm plots (Treecovery, mainly in Tanzania)
   a. Agroforestry (Treecovery): pruning and protecting trees to allow them to grow back
   b. Engagement with local leaders and institutions for institutional support, such as by-laws (local rules) to protect the trees
   c. Improved agricultural practices, including digging water trenches on the farms

We always combine these activities with capacity building, knowledge sharing and other forms of community engagement to raise awareness and inspire people through communication.

NEW LANDSCAPES IN 2022

In 2022, we started with the implementation of restoration activities in one new landscape: South Rift. We also started a new program with new partners in an existing landscape, Northern Tanzania. In Singida, Central Tanzania, we added new villages to our existing program.

TOTAL AREA UNDER RESTORATION

Almost 400,000 hectares under restoration

We calculate the total area under restoration by adding up:
- The area of farmland where trees are brought back (based on average farm size)
- The area covered with physical restorations such as water trenches and water bunds
- The area that is protected from grazing (restoration through 'resting') by establishing grazing reserves and grazing management
- The area that is covered with grass seed banks

After starting our first bund sites in Kenya, the area that has been brought under restoration has been growing fast as shown in Figure 3. In 2018, there was a steep increase when we kick-started the tree recovery program with farmers in central Tanzania (Figure 2). In 2021, new areas in Tanzania and Kenya were added. In 2022, the total area under restoration increased by 18% to over 380,000 hectares. That's the same size as 530,000 football fields!
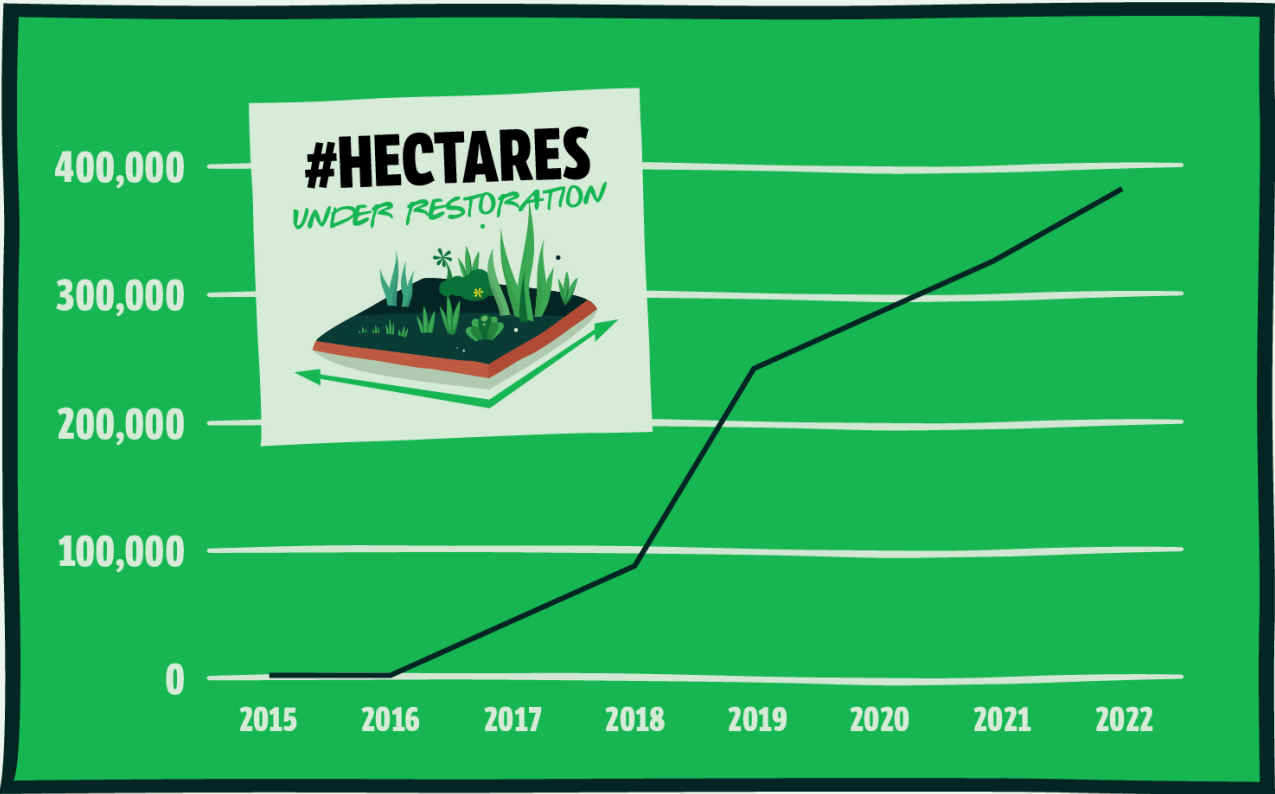
FIGURE 3: Growth in area under restoration. The figure shows steady growth in the total hectares under restoration, with the number steadily increasing from 2018 to 2022.

GROWING OUR OWN PROGRAMS
PART I: REGREENING RANGELANDS

BUNDS

We dug 315,000 bunds so far!

One of our main ways of restoring degraded grazing land is by digging bunds. In dry areas where the soil is degraded, rainwater can no longer infiltrate the ground. When it rains, water washes away unused. This causes erosion and the loss of fertile soil. As a result, the land degrades even further.

By digging semi-circular water bunds, we open up the hard top layer of the soil. The bunds slow down and capture rainwater running downhill, preventing soil erosion. Rainwater has more time to enter the soil, which increases the water availability for vegetation. The newly sown grass seeds will get the chance to sprout, and eventually allow the area to turn green, lush and cool. The restored vegetation promotes infiltration and water retention even more and breaks the cycle of degradation. Vegetation brings more moisture into the air through increased transpiration, which contributes to a cooler microclimate. It reduces erosion, captures carbon from the atmosphere and improves the quality of the soil.

In 2022, water bunds have been one of our most important interventions. We dug 112,614 water bunds, covering over 1,120 hectares of degraded rangelands. This is more than twice as many new bunds than in 2021! The bund areas will be protected from grazing for a few years, so the planted grasses have the chance to establish and thrive before livestock is allowed back in. So far, we dug a total of 314,943 bunds across all landscapes (Figure 4).
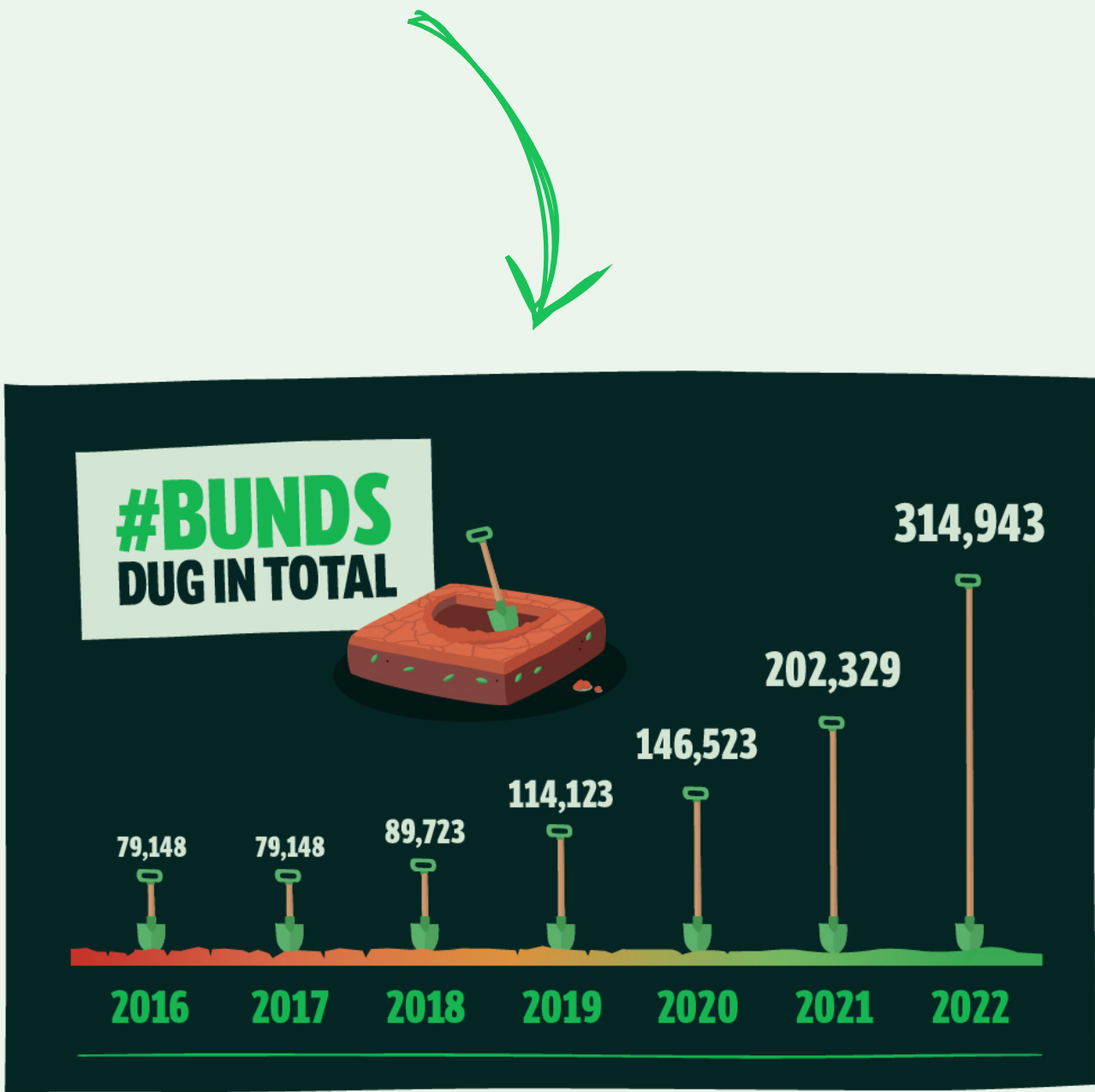

FIGURE 4: The gradual increase in the total number of bunds dug.

1. JUSTDIGGIT'S GLOBAL FACTS & FIGURES

GRAZING MANAGEMENT

A total of 13,195 hectares under controlled grazing

Grazing management is critical for restoring rangeland. Newly reseeded bund plots need to be temporarily protected from grazing so that the grass has time to grow strong enough. And overgrazed areas, such as livestock routes, sometimes just need to be protected to recover. To do this, we use a traditional way of conservation: grazing reserves, sometimes called Olopololis. Grazing reserves are non-fenced areas temporarily protected from grazing.

Grazing reserves are mainly used as a method for restoration in the Amboseli landscape. The first 8 grazing reserves were established in 2017. In 2019, we added another 10. In 2022 we redefined and remapped the existing grazing reserves in the Amboseli landscape together with our partner Amboseli Ecosystem Trust (AET). The area has recently been subdivided, which means that certain areas are privatised and others are designated for a specific type of land use. Therefore, two grazing reserves were dropped as these areas are now used for settlement development. Nevertheless, about 10,000 hectares remained under grazing management in 2022.

Besides grazing reserves, areas with physical restoration interventions, such as bunds, also need to be protected from grazing. Areas with recovering vegetation are very popular grazing spots, especially in dry times. Therefore, protecting restoration sites takes a lot more than just drawing or marking a boundary. Our partners are working closely with grazing committees: community members that are in charge of formulating and enforcing grazing rules and regulations. Together, we ensure that these rules are established, improved and enforced, so the intervention areas get enough rest for good rehabilitation.

In 2022, we started physical restoration in our newest landscape South Rift, where we established bund sites and other physical restoration measures in 4 new sites. With 51 hectares, the total area is still relatively small. We plan to add new restoration areas this year.

In the Chyulu landscape (the location where the digging of our bunds first started!) the area under restoration was doubled, from 1,059 to 2,125 hectares in total.
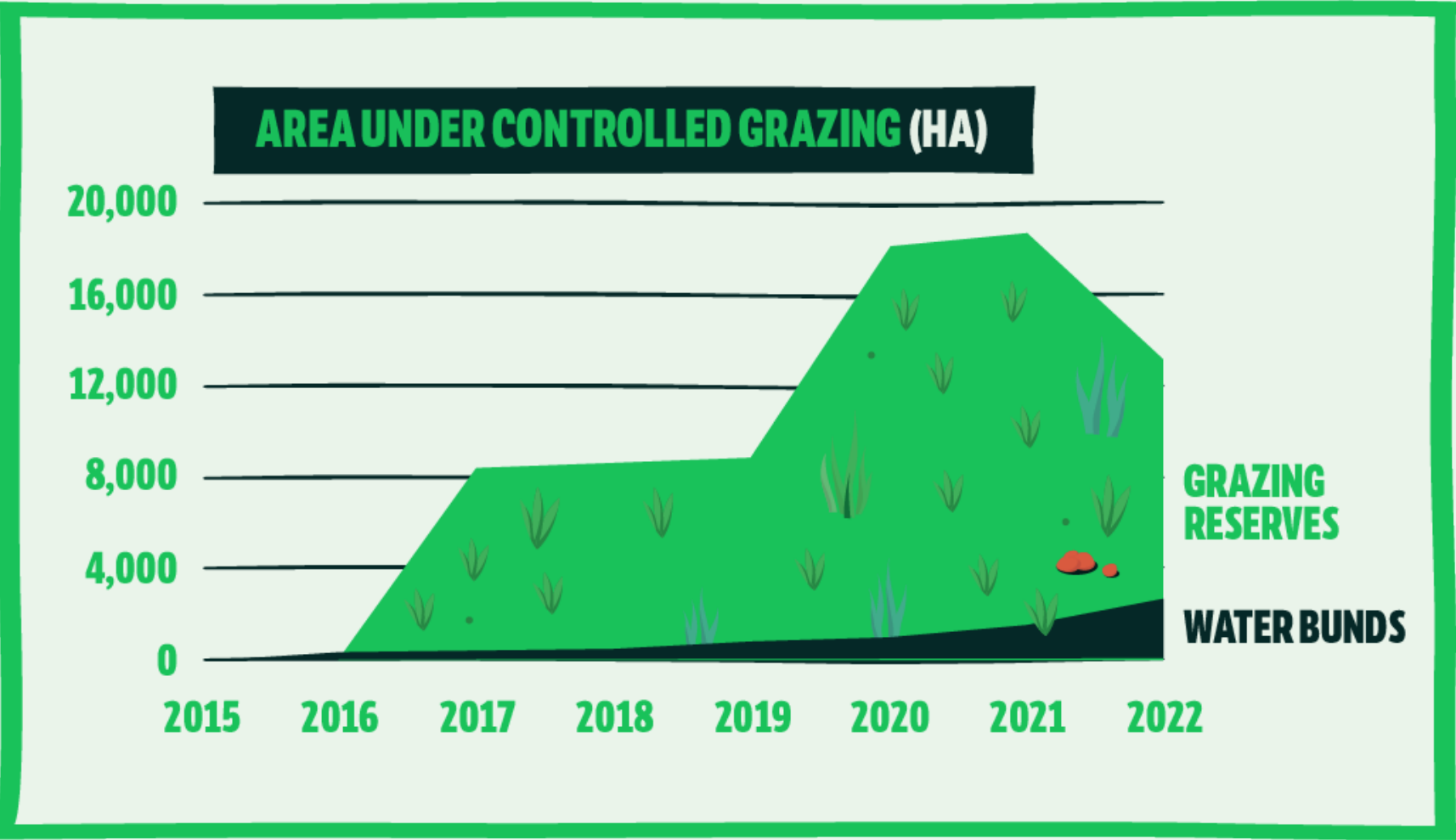

FIGURE 5: Total area under controlled grazing.

1. JUSTDIGGIT'S GLOBAL FACTS & FIGURES

COMMUNITY ENGAGEMENT

2,542 diggers so far

Community engagement is also essential for our work. For our areas under grazing management, we do this to ensure that the entire community is aware of the importance of protecting the grazing reserves. These areas need to be marked, for example with poles, so there cannot be any confusion about where grazing is allowed, and where it's not.

Community engagement was an important focus area in Amboseli and South Rift in 2022. Central in this strategy was a form of horizontal learning, where grazing committees visited the grazing committees and restoration areas in the successful Chyulu landscape. More about this in chapter 2.

For bund plots, we take community engagement to the next level. Besides close collaboration with community members and leaders about the exact location and boundaries of the bund plots, we directly involve community members in the project by digging! Asking community members to do the digging has two main advantages. Firstly, diggers are paid for every bund they dig. To ensure the quality of the bunds, we maintain a maximum number of bunds a person can dig. Community members throughout our landscapes mention the added value of this source of income to their livelihoods, especially in difficult times such as during droughts. Secondly, directly involving the community in the projects creates a feeling of ownership among community members. The bunds are no longer just a Justdiggit project, but a community project. This feeling of ownership is shown by the reports of community members "running towards the bunds after the first rains, seeing if they held water".

The importance of this ownership amongst the community for the success of a program has been shown countless times. With a feeling of ownership, people are more likely to accept and respect interventions that initially may not be in their best short-term interest, such as grazing restrictions in our case. Each new bund plot (with one exception) is designed and implemented with a different community. In this way, more and more people are involved in our projects. This helps spread the important message of landscape restoration and sustainable grazing management across our landscapes. To date, 2,542 individual diggers have been involved in the construction of water bunds!
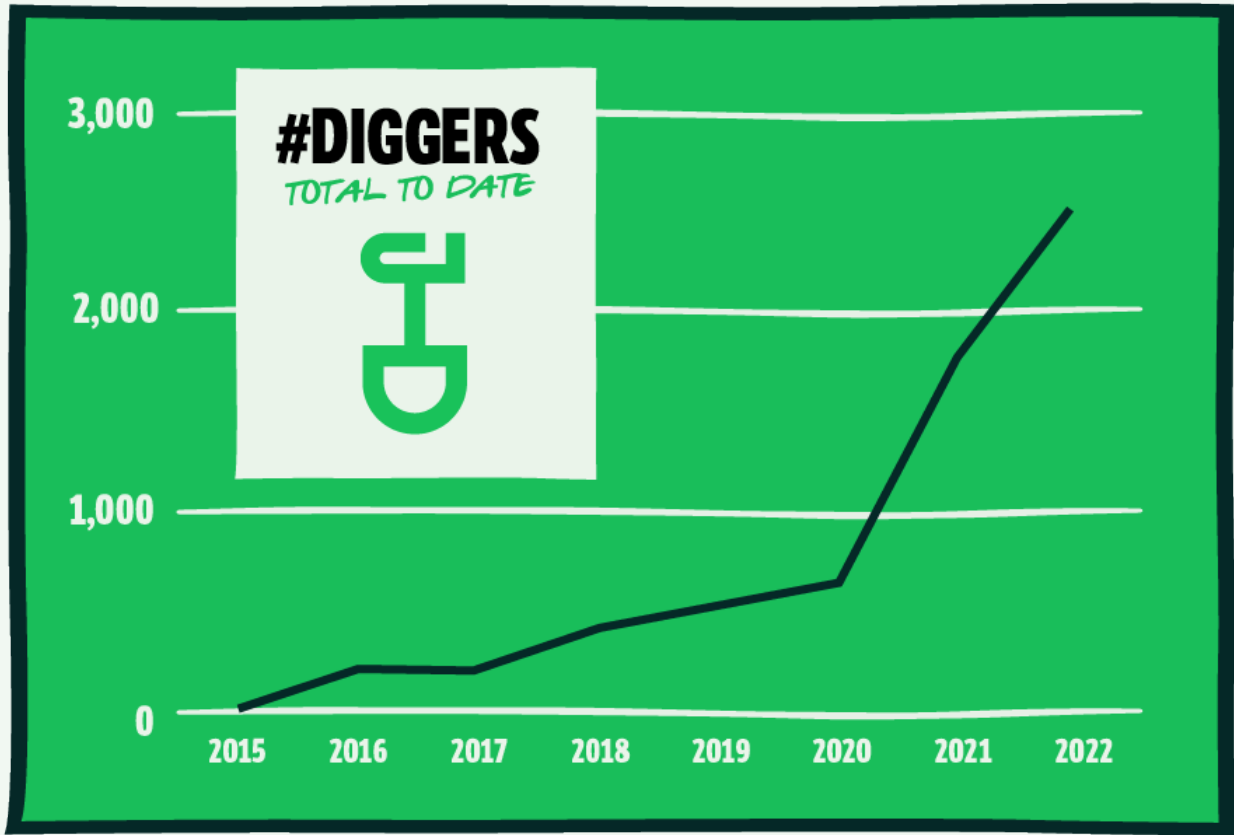
FIGURE 6: Cumulative number of diggers involved in the bund projects, by year.

GRASS SEED BANKS

4 new grass seed banks established in a new landscape

Establishing grass seed banks is one of the interventions we often apply in rangelands. A grass seed bank is a small plot of communal land used for the production of grasses and grass seeds. We select a plot of about 10 to 15 hectares of land together with the local leaders to become a grass seed bank. Each seed bank is managed by a group of about 20 to 25 women, depending on the size of the plot. They fence the plot to protect the grass seed banks from grazing livestock and wildlife. After that, they prepare the soil and sow the grass seeds with our support, followed by maintaining the plot by removing weeds and securing the place.

When the grasses reach maturity, they produce grass seeds which are harvested and sold by the women's groups. This income provides an alternative livelihood for the women, allowing them to become more self-sufficient. It can help them pay for school fees, health care, and to support their families. The stems of the grasses are also harvested and used or sold as hay for livestock feed during the dry season when grazing resources are getting scarcer. Other people in the communities see the successes of the grass seed banks, elevating the women's status within their community. After a grass seed bank is established Justdiggit pledges to buy the harvest from these women's groups for the next few years.

In 2022, we started 4 new grass seed banks in Northern Tanzania, as part of the HUSISHA program. Adding to the existing grass seed banks in the Chyulu and Amboseli landscape, they bring the total number of seed banks to 12, turning over 63 hectares of bare land into dense grassland!
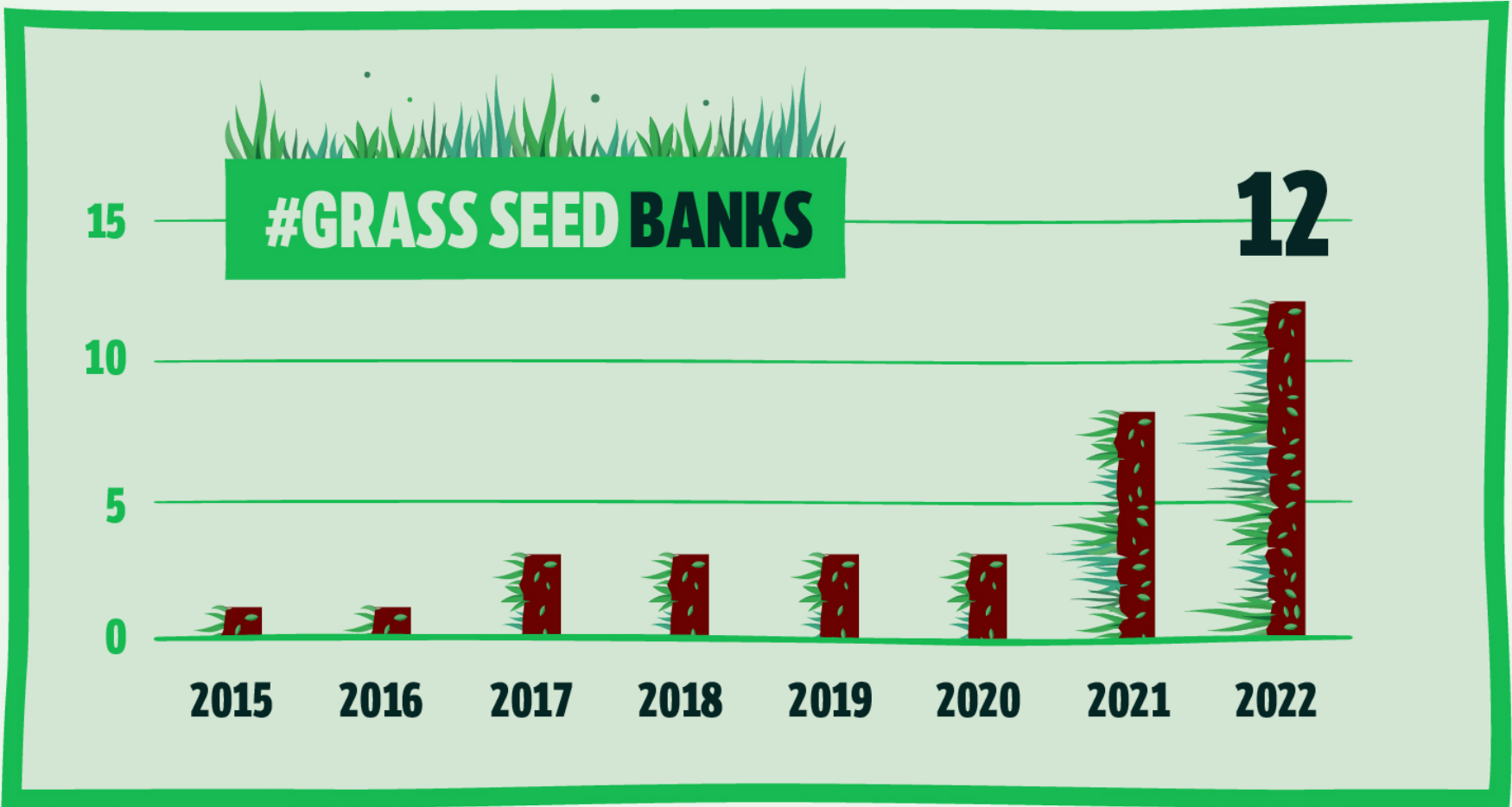

FIGURE 7: The total number of grass seed banks, by year.

1. JUSTDIGGIT'S GLOBAL FACTS & FIGURES

WOMEN ENTREPRENEURS

272 women engaged in women's groups

The number of women managing the grass seed banks has steadily increased over the years. In 2021 and 2022 we engaged new women groups to manage and benefit from newly established grass seed banks in Amboseli and Northern Tanzania landscapes. In 2022, 100 new women were engaged in the 4 new grass seed banks in Northern Tanzania, adding up to 272 women in total!

#WOMEN ENTREPRENEURS

- NORTHERN TANZANIA
- AMBOSELI
- CHYULU
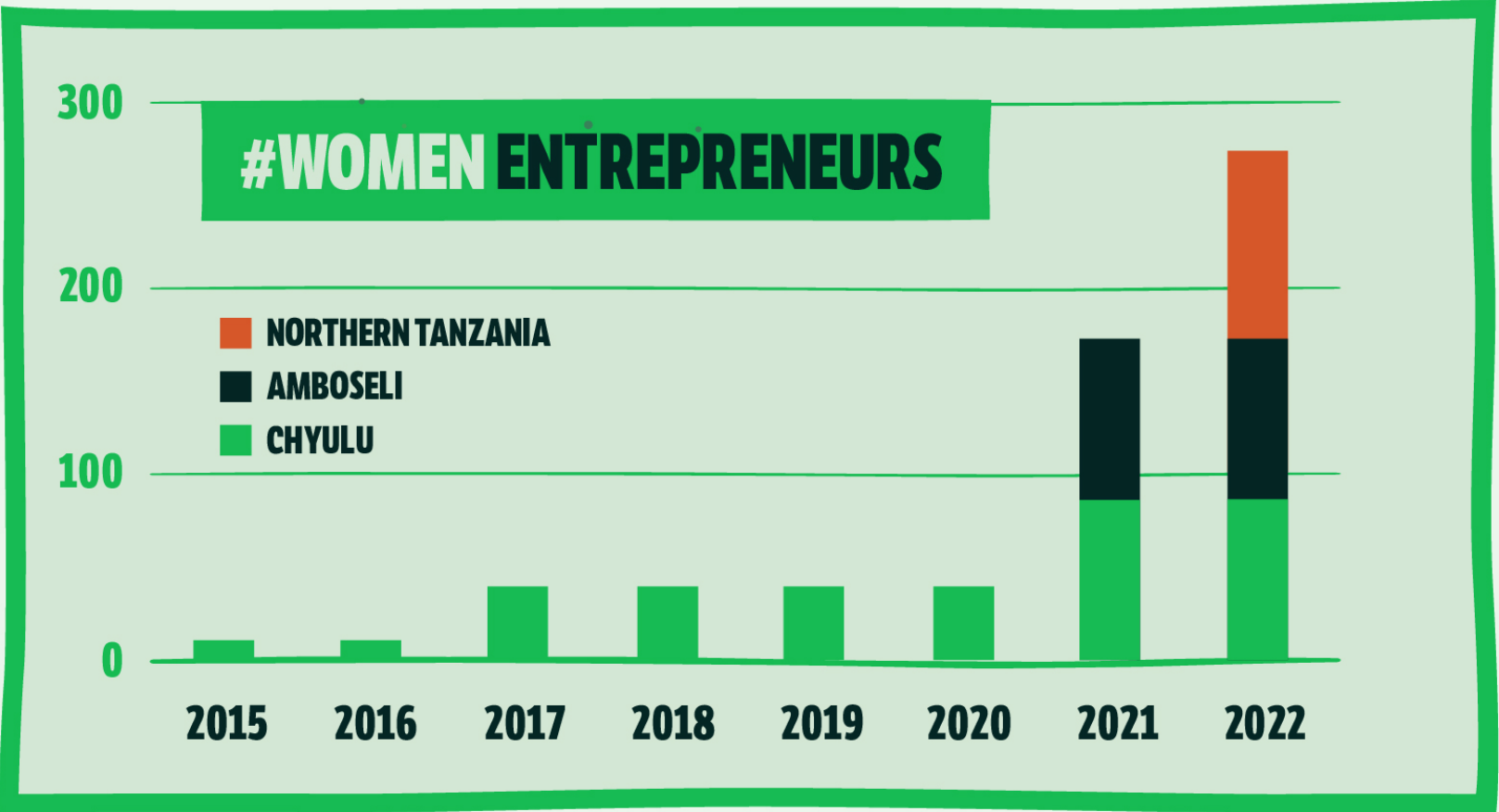
FIGURE 8: The number of women entrepreneurs in grass seed banks across the three landscapes.

Across all landscapes, we started to turn the grass seed banks into landscape restoration enterprises. These enterprises are based on selling the harvested grass seeds on the local market. The aim is to improve economic opportunities for local communities while restoring degraded landscapes. Besides an extra income for the women and more green in the dry areas, this project also helps to maintain indigenous rangeland grasses which are often neglected and underdeveloped in terms of market value and conservation. Bringing all seedbanks together under a structured enterprise will improve access to the market, reduce risks, make for a better negotiation position and ensure a quality standard across the board.

The grass seed banks benefit the wider environment, as they attract insects and small animals which stimulates the recovery of the ecosystem and supports the growth of vegetation in the immediate surroundings. And by the sale of grass seeds to other landscape restoration projects such as our water bund sites, grass seed banks help regreen other areas!

GROWING OUR OWN PROGRAMS
PART II: AGROFORESTRY

Rangelands are not the only type of land in desperate need of restoration. Vast areas of farmland are degraded as well. Poor farming practices, monocultures and removal of trees have depleted the soils, leaving the farmland vulnerable to erosion and other types of land degradation. We help rehabilitate these areas by bringing back trees into farmlands and promote more sustainable farming practices.

In our Treecovery program, which is implemented in Tanzania, we inform and inspire farmers about the benefits of having trees on their farmland. With our partner LEAD Foundation, a network of trainers, media and different communication tools we share the technique of treecovery or Farmer Managed Natural Regeneration (FMNR) with farmers. Treecovery is an agroforestry technique to regrow trees and support new, naturally emerging sprouts to grow big. Treecovery involves a process of selecting, pruning and protecting stumps of cut-down trees. With the right care, these stumps get the chance to grow into real trees again.

This combination of agriculture and forestry is called agroforestry. It has many benefits for both the farmers and the natural environment. The returning vegetation intercepts rainfall, slowing the water down and reducing its erosive power. Meanwhile, root systems increase infiltration, reduce runoff and improve soil conditions. All mixed together this can significantly increase crop yields! Trees also contribute to increased biodiversity and reduce the risk of pests, while they provide fruits, nuts, fodder, medicinal values, shade and wood for farmers. By combining treecovery with rainwater harvesting, farmers create more climate-resilient and profitable farmland and regenerate their environment.

1. JUSTDIGGIT'S GLOBAL FACTS & FIGURES

OUR REACH: NUMBER OF VILLAGES

A total of 550 villages reached

Our treecovery program started in 2017 in the Dodoma region in Central Tanzania. The program started as a pilot running in 66 villages in the Kongwa district. In 2018, we started to roll out the program to 275 new villages with our partner LEAD Foundation. This adds up to a total of 341 villages! In May 2021, we expanded the program in the neighbouring region of Singida.

In 2022, the Treecovery program mainly grew in the Singida (Central Tanzania), and Arusha and Manyara (Northern Tanzania) regions. We were able to add 74 new villages to the program in Singida, bringing us to a total of 140 villages. In Northern Tanzania, we started a new program with our new partner TRIAS, where we combine both treecovery and rainwater harvesting interventions in 63 new villages, totaling 69 villages. The Dodoma program entered into the sustainability phase, which focuses on maintaining the trees in the existing villages. As a result, the total number of villages grew in 2022 by 137, from 413 to 550 villages (a 33% increase!).
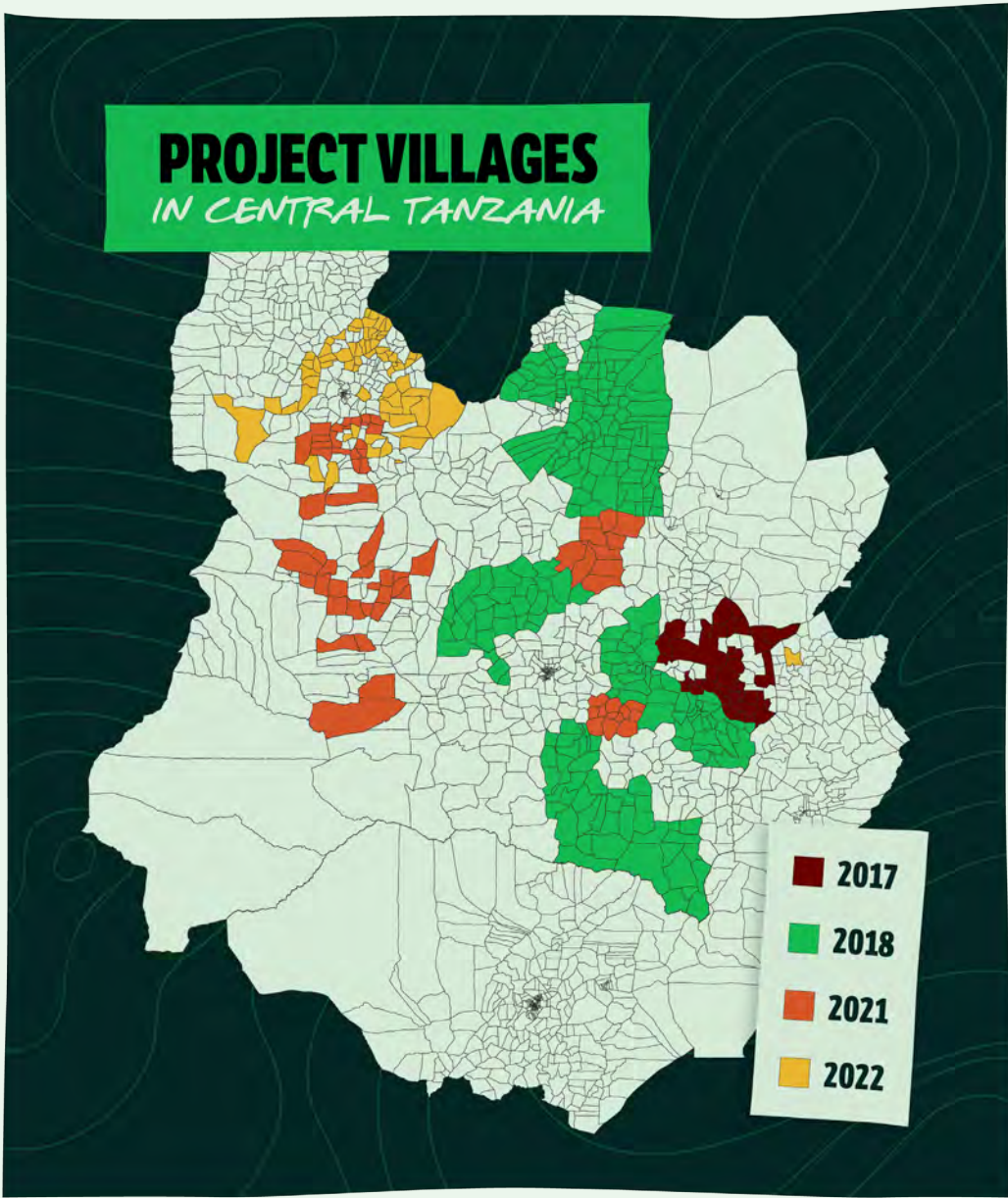
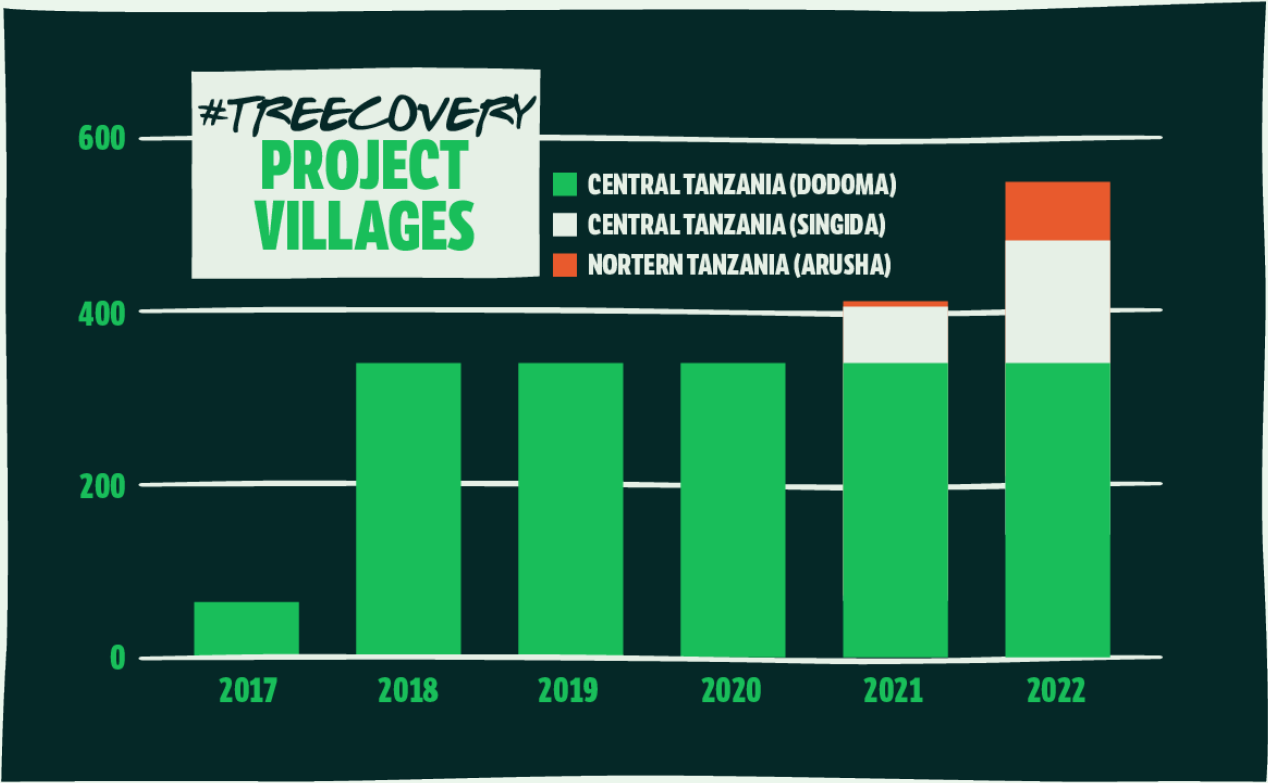**FIGURE 9**: Treecovery villages in Central Tanzania.

FIGURE 10: Number of villages where Justdiggit and Lead Foundation are promoting treecovery, per landscape.

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1. JUSTDIGGIT'S GLOBAL FACTS & FIGURES

CHAMPION FARMERS

Almost 2,000 champion farmers to train and motivate other farmers

Champion farmers play a critical role in training and motivating other farmers. They also coach other farmers on the correct implementation of treecovery and help us monitor the number of trees that are brought back. Since the start of the Dodoma program in 2018, the number of champion farmers in Dodoma slightly decreased. Sometimes champion farmers decide to quit their role, or the program is discontinued in some villages. Since the expansion of the program to Singida and Northern Tanzania in 2021, the total number of champion farmers has strongly increased. In 2022, 379 new champion farmers became active, adding up to almost 2,000 in total!
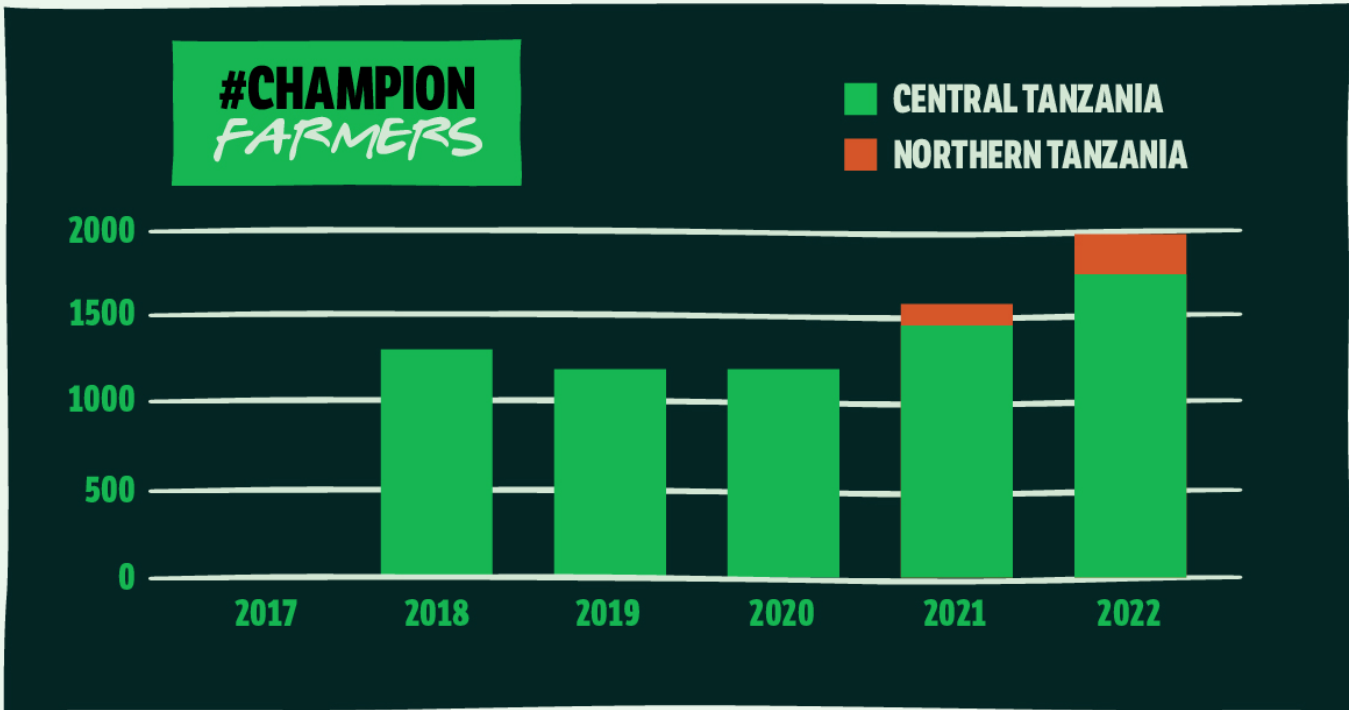
FIGURE 11: The total number of champion farmers in Northern and Central Tanzania.

ACTIVATED HOUSEHOLDS

Over 150,000 households are practising treecovery

To reach the farming households, we train champion farmers and organise movie roadshows to inspire and activate the people in the villages to start practising treecovery. Between 2018 and 2020, the number of households in the villages that started practising treecovery continued to steadily increase. In May 2021, we expanded the program to the neighbouring region of Singida.

The number of households practising treecovery in the villages in Dodoma has continued to steadily increase. In 2021 and 2022, we were able to activate new households in the newly included villages in Singida and Northern Tanzania to bring back trees on their farms.

The number of activated households is a very important indicator for us! Not only to monitor if we are successfully growing the regreening movement, but also to find out if the farmers continue to implement the regreening practices. We are happy to report that the movement is indeed steadily growing. With a 22% increase of active farmers in 2022, there are now over 150,000 activated farming households who are growing and keeping more trees on their farmland – that's quite a lot of people!

With an average farm area between 2 and 2.5 hectares, we can estimate that this represents an area of almost 350,000 hectares of farmland with more trees.

FIGURE 12: The total number of active households, by year.

TREES BROUGHT BACK
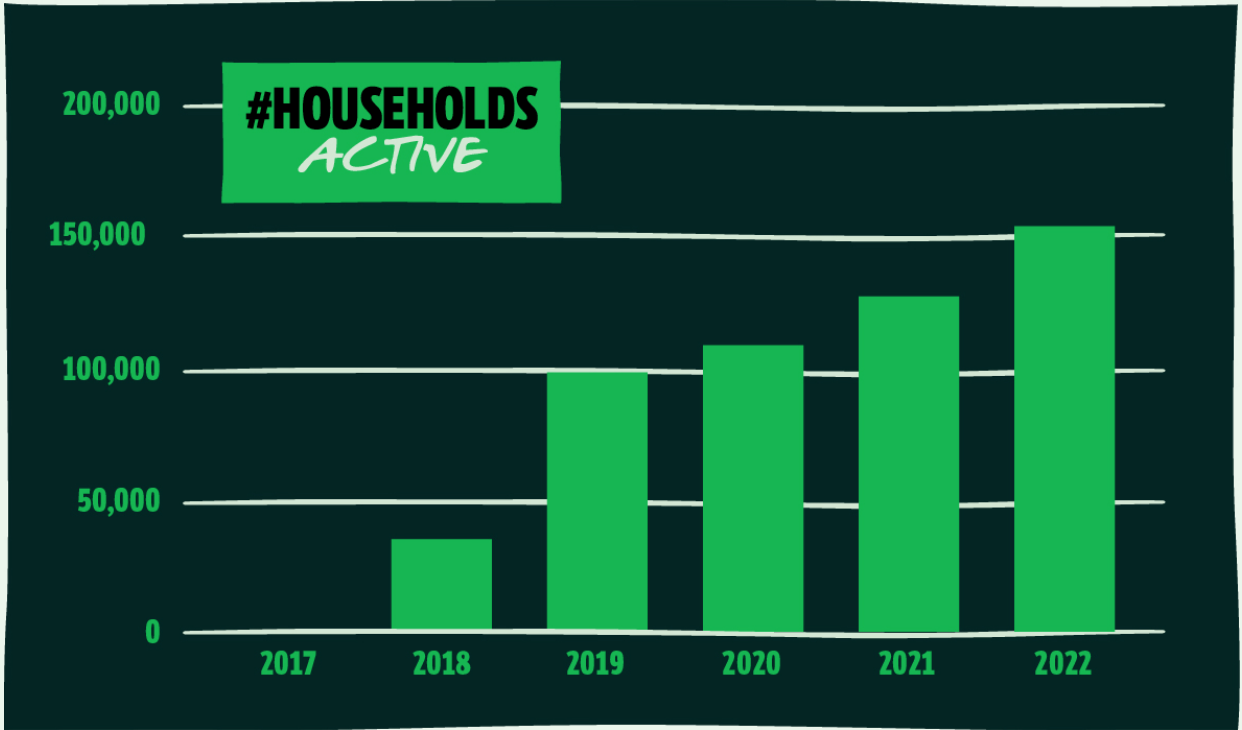
Almost 14 million trees so far!

It's safe to say that 2022 was a great year for (treecovery) trees. We've now almost hit 14 million trees, which were brought back through our Treecovery programs! The majority of these trees are brought back in the Dodoma region in Central Tanzania, where we have been promoting treecovery the longest. However, the program in the Singida region also started to contribute to the grand total. For Northern Tanzania, it's still too early in the process to see any results. We recently started to promote treecovery in a large number of villages there and expect to report the results in the next impact reports.

We decided in 2022 to verify the number in our monitoring system, because the trees are counted and reported manually. We found out that although we use a very extensive and detailed monitoring system to keep track of the number of trees farmers are bringing back, the actual number of trees is most likely (much) higher! More on this in chapter 3.

FIGURE 13: The total number of trees brought back since 2018 using treecovery techniques in Tanzania.

TREES PER HOUSEHOLD

The average number of trees per household continues to grow.

In 2022, we started to monitor the behaviour of active farmers in the sustainability phase. Interestingly, the average number of trees per individual farming household has continued to increase – even though most farmers in the Dodoma program started practising treecovery in 2018 or 2019! This means that the increase in the total number of trees is not only a result of the activation of new farmers but also of the already activated farmers still adding more trees to their farms. During a monitoring visit in October 2022, farmers reported that they generally start with a small number of trees to first see the effects. After witnessing the benefits, they continued to add more trees. Although these specific insights were gained from a small sample, this trend is confirmed by the overall numbers.
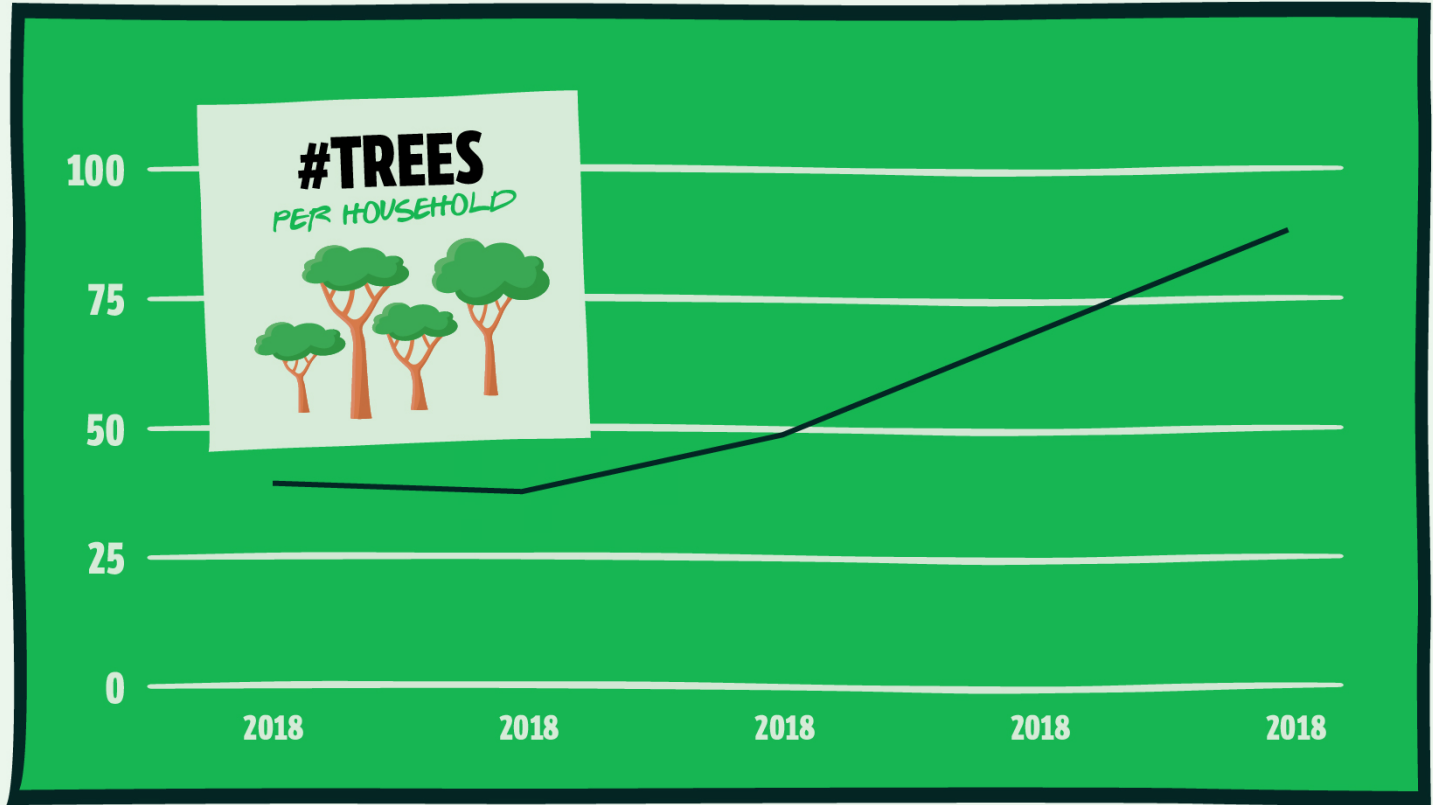

FIGURE 14: The average number of trees per household in Dodoma, by year.

1. JUSTDIGGIT'S GLOBAL FACTS & FIGURES

WATER TRENCHES

139 kilometres of water trenches

Digging water trenches (called fanya juu and fanya chini in Swahili) is an important part of our regreening toolbox. We dig them in projects on both agricultural land and rangeland. Water trenches are complementary interventions on sloped farmlands, as regenerating trees may not be sufficient to reduce surface runoff and increase rainwater retention on these terrains.

We promote the implementation of water trenches to farmers in our project areas. The literal translation of these Swahili terms already gives you an idea of what this practice consists of: "throw it up' and 'throw it down'!

More specifically, the excavated soil after digging water trenches on the contours of the slope is made into a dyke either up or downhill of the water trench. These water trenches now retain excess rainwater and reduce erosion. The construction of these water trenches requires quite some technical skills and labour, so we encourage farmers to work together and implement these interventions on each other's land.

The number and total length of water trenches grew steadily in 2022. With a total of 1,439 new water trenches with a length of over 33 kilometres, the total length reaches over 139,200 metres! These trenches will retain rainwater that would otherwise be lost. In this way, they provide water to crops and reduce soil erosion in the process – eventually regreening the area!

Although the majority of the water trenches are dug on cropland in Tanzania, we also dug water trenches in the South Rift landscape in Kenya. As the biggest part of the water trenches are dug in the agroforestry program in Tanzania, we report it in this section.
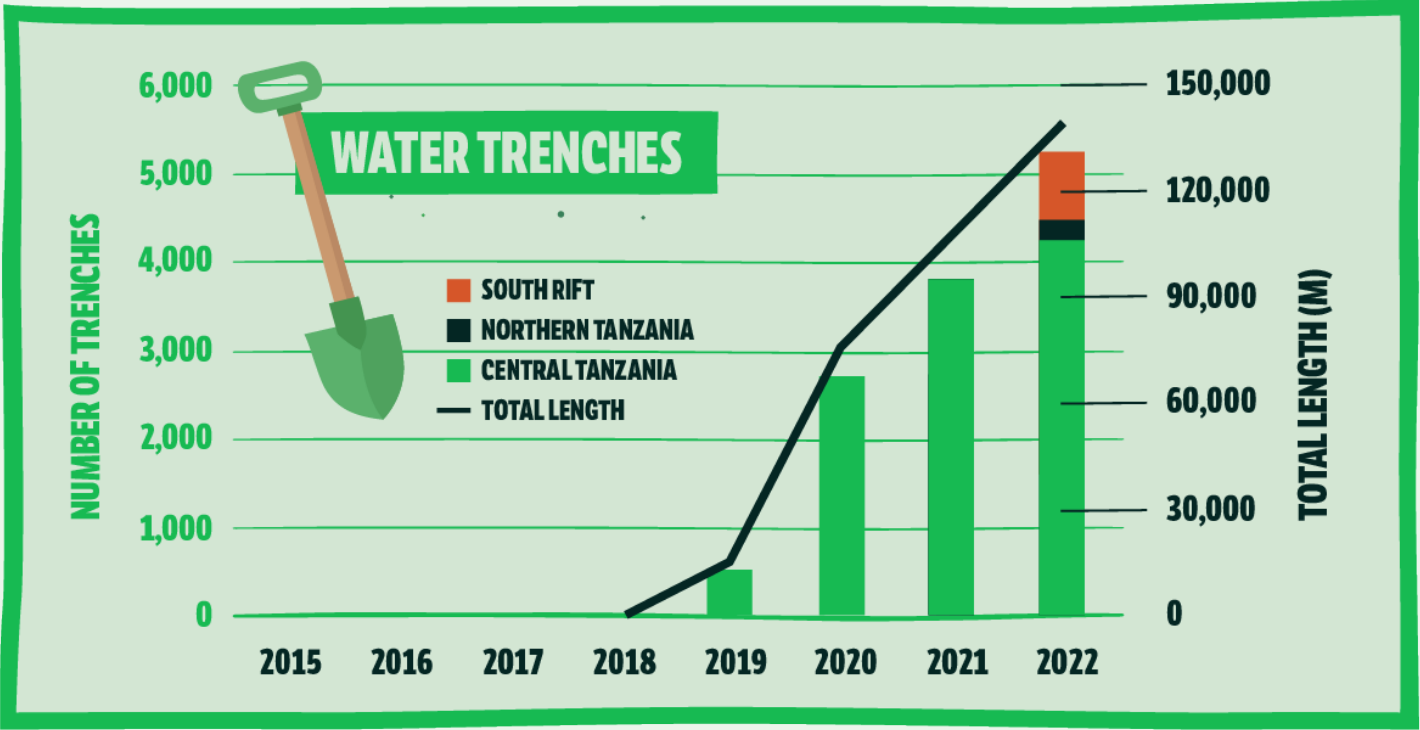

FIGURE 15: The total number of water trenches dug, by year.

1. JUSTDIGGIT'S GLOBAL FACTS & FIGURES

AWARENESS

Movie roadshows
44,000 new people reached with movie roadshows
Justdiggit is all about a strong communication approach! We use communication to increase our impact in Africa and to raise awareness about the great potential of nature-based solutions worldwide.

One of our most effective (and most fun!) communication tools are movie roadshows. The movie roadshow is the first communication event that we organise in new program villages in order to promote regreening and the practice of treecovery. It's often combined with other communication channels, such as radio, SMS and visuals on murals. During the roadshow event, local program coordinators, champion farmers and community members express and discuss the need for regreening in the form of speech, dance, drama or song. The day ends with an outdoor movie show on a large screen, where the Treecovery movie is shown. These educational 'festivals' are a sight to behold: every group or village performs their own dance style and songs!

The movie roadshows have proven to be popular events in our project areas. In 2022, approximately 44,000 people attended the roadshows, with an equal distribution of about one third men, one third women and one third children. So far, we recorded that over 400,000 people have attended the movie roadshows. As some villages were visited twice, we conservatively estimate that about 222,500 individuals visited the roadshows so far.

Murals
An estimated 650,000 people reached
By the end of 2022, 506 murals have been painted throughout villages in Tanzania. In the Dodoma region, based on household surveys, we estimate that 57% of people living in program villages where we are active, have seen one of these murals. This is about 650,000 people!

SMS services
Over 47,000 people receiving SMS messages about treecovery
Since 2019, we have been promoting treecovery and sustainable land management practices through an SMS service. Farmers, or other interested people, can sign up for free and will then receive weekly messages. These messages remind farmers for example about the benefits of using treecovery, or when it is the right time to start pruning the trees. During our roadshows, champion farmers actively promote this service and help other farmers to sign up. Halfway through, the service had around 60,000 active subscribers.

During the second half of 2021, we moved to a different service platform. This meant we had to re-enroll all subscribers, leading to a decrease in subscriptions to approximately 43,000 active subscribers. In 2022, we were able to welcome 4,403 new subscribers, bringing us to over 47,000 subscribers. Since 2019 we have sent over 4 million messages to our subscribers!
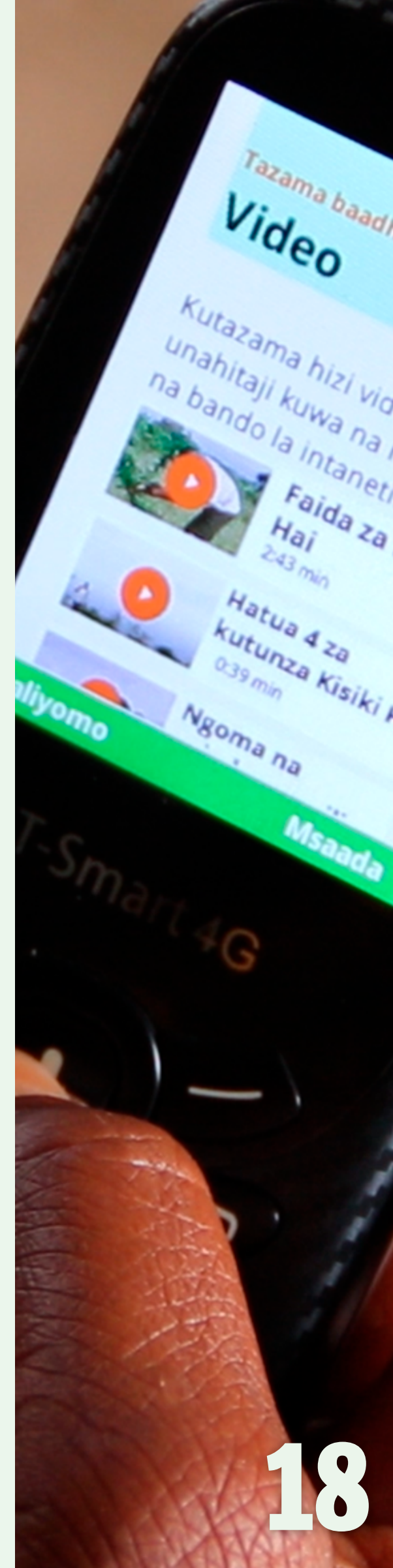
OUR ESTIMATED IMPACT

WATER RETENTION

Estimated over 3,750,000,000 (3.75 billion!) litres in 2022

The goal of our interventions is to make landscapes and livelihoods more resilient by bringing back natural vegetation. Retaining as much rainwater as possible is key, as water availability is absolutely crucial in bringing back vegetation. When the natural vegetation has disappeared, the topsoil often hardens, which limits the infiltration capacity. In this way, dry and bare soils often get even drier.

The interventions we use slow down or capture runoff water, increase infiltration, and generally retain rainwater where it falls. Water bunds and water trenches do this literally by catching surface runoff, giving it time to slowly infiltrate the soil. Recovered trees intercept rainwater with their canopy, breaking open the soil with the roots and generally increasing infiltration.

Using regional precipitation data and infiltration and runoff models, we can get an idea of the total volume of water that is retained by our interventions. Unlike with bunds, we can not count each unit of retained water, so these models provide a rough figure of the total volume of water retention. We will elaborate further on the models and assumptions used in chapter 3. Using these methods, the total water volume retained through our interventions is estimated to be over 3,750,000,000 litres in 2022.

3.75 BILLION LITRES
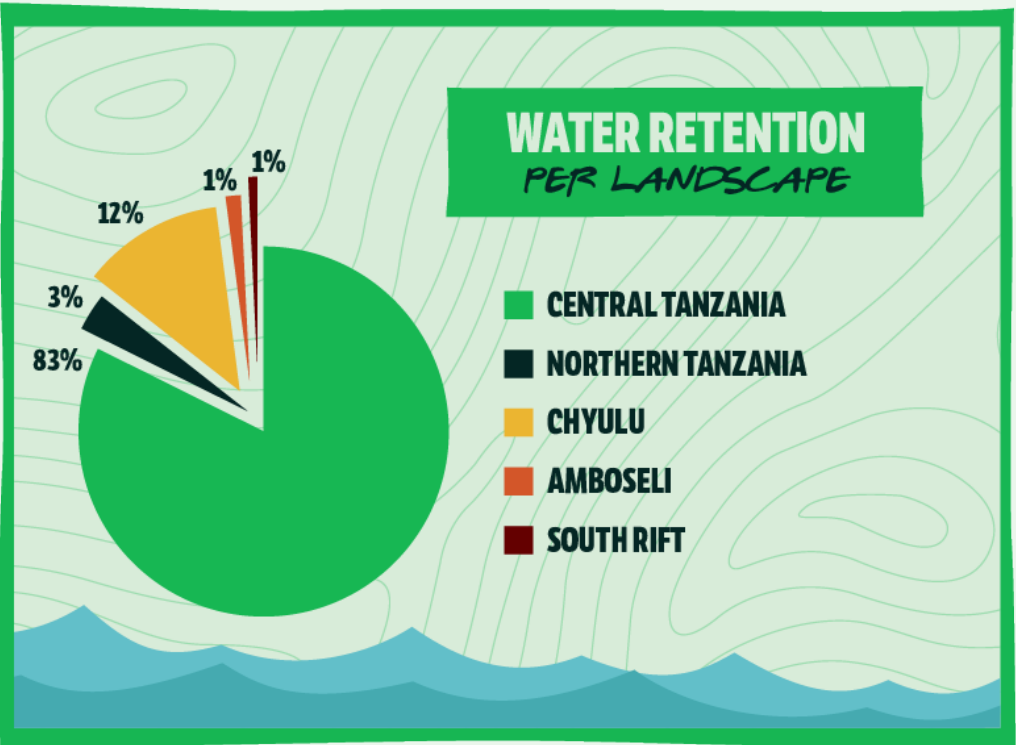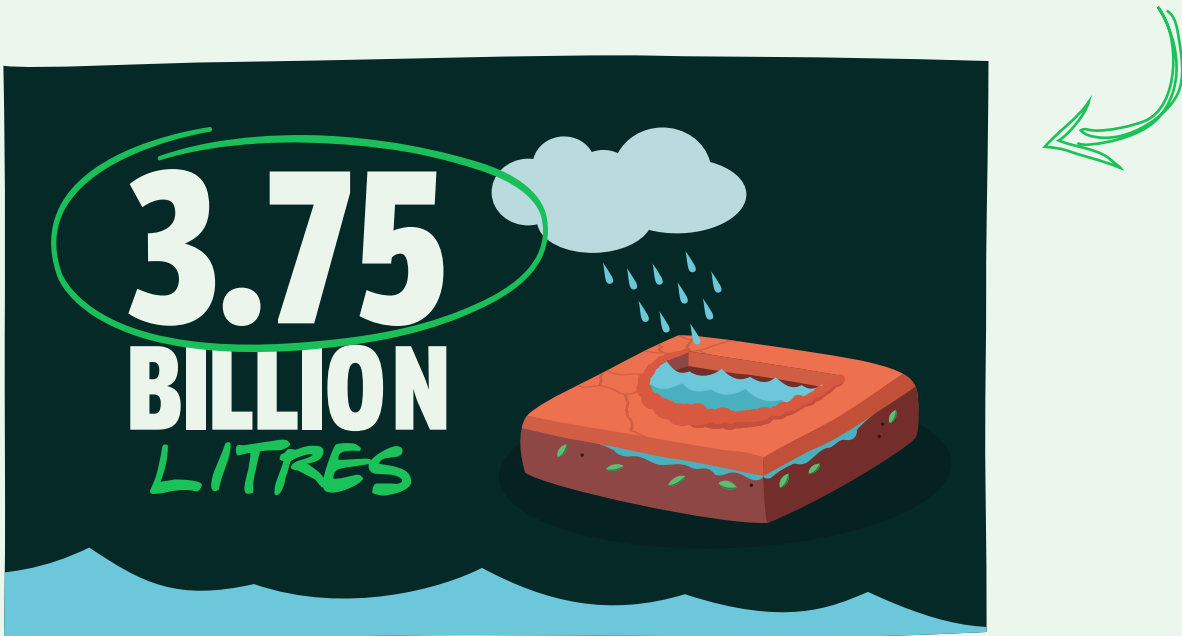
FIGURE 16: Water retention per landscape.

WATER RETENTION PER LANDSCAPE
- 83%
- 3%
- 12%
- 1%
- 1%
- 1%
- CENTRAL TANZANIA
- NORTHERN TANZANIA
- CHYULU
- AMBOSELI
- SOUTH RIFT
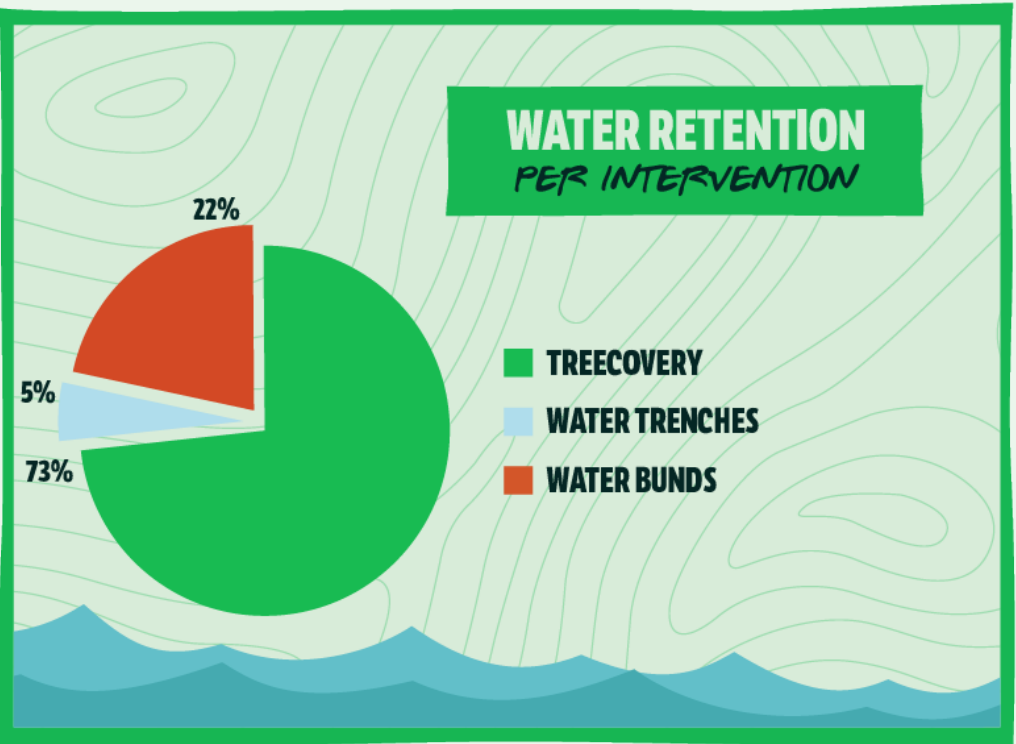
FIGURE 17: Water retention per type of intervention.

WATER RETENTION PER INTERVENTION
- 73%
- 5%
- 22%
- TREECOVERY
- WATER TRENCHES
- WATER BUNDS

The pie charts on the left show the breakdown of this number across the different landscapes and intervention types. The retention for certain landscapes does not always directly relate to their total restoration area, even for similar interventions. The main reason for this is the difference in precipitation over 2022. Intervention areas in southern Kenya and northern Tanzania received relatively poor rains compared to the long-term average. Also, the time of implementation is taken into account, which explains the relatively low volume for water trenches in northern Tanzania. Since they were constructed near the end of the year, they only received a few rainfall events. Two different methods were used to calculate the retention volumes, on which we will elaborate more in chapter 3.

1. JUSTDIGGIT'S GLOBAL FACTS & FIGURES

MICROCLIMATE

Temperature decrease and soil moisture increase

A favourable microclimate is important. Not just because it is pleasant to be in and is linked to several health benefits, but also because it acts as a buffer for extreme weather events and can lead to higher crop yields. Our interventions directly contribute to improving the microclimate in and around our intervention areas. After all, the availability of water and vegetation is crucial in maintaining a good microclimate!

In 2022, research conducted by our partner MetaMeta Research found a significant decrease in atmospheric temperature and an increase in soil moisture content in one of our grass seed banks, compared to the surrounding area. The study showed that the land surface temperature decreased by about 1.32°C! This shows that bringing back vegetation can make a significant difference – even in relatively small areas such as a grass seed bank.

Also in 2022, a new research initiative by Planet and ESA helped us quantify these differences using remote sensing techniques. Chapter 3 will elaborate more on the effect of our interventions on the microclimate and the different methods that help us better understand this.

CARBON SEQUESTRATION

Better insight through external verification

Since all our interventions aim to bring back vegetation, they inherently sequester carbon dioxide as well. In our Treecovery programs in Tanzania, CO_2 is converted into woody biomass. In our rangeland restoration programs, it is turned into grass and eventually into soil organic matter.

Since our programs are implemented on a large scale, the volume of carbon sequestered becomes significant too. Yet, measuring carbon sequestration on such a large scale is challenging. Therefore, we started working with Face the Future: a consultancy specialised in forestry and carbon measurements. They assessed and verified the volume of carbon captured in trees that are recovered in our program in Dodoma, Central Tanzania. We will use this to further refine our carbon monitoring and reporting methods.

For our rangeland restoration programs, we are currently preparing the implementation of a new carbon monitoring methodology with our new partner Seqana. Chapter 3 will elaborate more on carbon sequestration in our programs and how we monitor this.
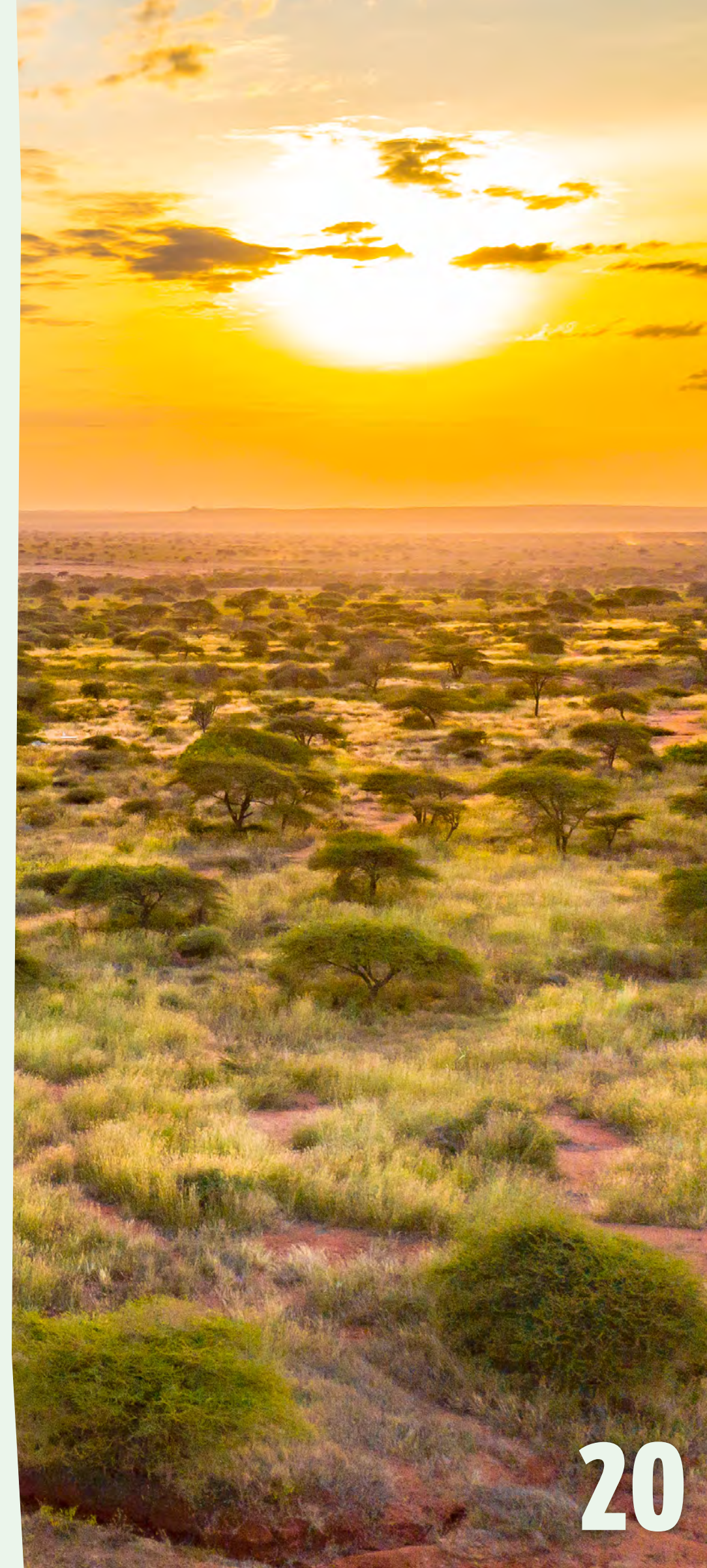
DEEP DIVE IN THE LANDSCAPES

AMBOSELLI-KENYA

AMBOSELI - KENYA

Partners: Amboseli Ecosystem Trust (AET), African Conservation Center (ACC)

INTRODUCTION

Amboseli National Park in the South of Kenya is surrounded by Olgulului-Ololarashi Group Ranch (OOGR), a rangeland area. These two areas form the Amboseli Landscape, shared by pastoralists, their livestock and wildlife. OOGR has a population of over 80,000 people, the majority of whom own livestock that relies on the area's grazing grounds. The increasing pressure of humans, their livestock and wildlife in these areas have led to the reduction and disappearance of woody vegetation and animals. To restore and rehabilitate this fragile environment, we decided together with our local partners to implement various restoration techniques such as water bunds, Olopololis (grazing reserves), exclosures and Vallerani plowing. We also established grass seed banks to locally produce good quality grass seeds for restoration, while at the same time offering an additional source of income for the pastoralist communities, who very much depend on livestock. Together with our partner AET we also work with communities, local leaders, and grazing committees to manage the grazing areas.

The highlights for Amboseli in 2022

- We saw good results in both Amboseli and the South Rift landscape from the exchange visits we organised with the Chyulu landscape. Peer-to-peer learning and exchange of ideas proved really effective in changing communities' attitudes, more quickly than we probably would have achieved using any other means!
- Grazing rules were agreed and formalised and grazing management became more effective, with fewer incidents of people entering the grazing areas set aside for rest and restoration.
- One of the women's groups that manage and own the grass seed banks started to earn their first income from the grass seed bank. The women groups were motivated and inspired after learning from other women's groups during the exchange visits to the successful Chyulu landscape.

AMBOSELI - KENYA

LANDSCAPE RESTORATION

GRAZING MANAGEMENT

In OOGR, the key strategies for restoring the landscape are grazing management and setting aside areas to rest. We do this by establishing grazing reserves: non-fenced areas temporarily protected from grazing, so that the grasses can recover. We established 18 grazing reserves in 2021.

In 2022, new land use planning came into effect in OOGR. As a result, we had to remap our grazing reserves. Two of the 18 communal reserves, Ildepen and Endoinyo, were converted to settlement areas. After that, we remapped the remaining 16. This meant that the total area of grazing reserves was reduced to 10,681 hectares. Where needed, new landmarks were identified and painted white to designate the boundaries of these grazing reserves. This will help make it clear to pastoralists that the area is conserved and only available during dry seasons for grazing.

Protecting the grazing reserves from grazing is the biggest challenge when restoring areas through resting as these areas are not fenced. That's why we took extra measures to accomplish this and focused on strengthening the grazing committees last year. These committees play a central role to ensure protection from grazing. We helped to strengthen the committees through training and horizontal learning, by organising an exchange visit for the representative of the grazing committees to learn from their peers in another area. During a workshop, the grazing committees re-evaluated and agreed on by-laws (local grazing rules) for pasture management. The grazing rules were then formalised and standardised for all the OOGR grazing zones and pasture management areas. Now the boundaries and by-laws are documented and better monitored.

In addition to strengthening the grazing management committees, we held community meetings to raise awareness to ensure that community members understand and respect the revised grazing rules. These meetings were organised under the patronage of the group ranch leadership, elders, local leaders, grazing management committees and our partner AET.

The hard work has already paid off: as a result of the different measures, the grazing reserves are reported to be better managed and protected. There are fewer incidents of people grazing the protected grazing reserves, which confirms that people are respecting the rules better.

AMBOSELI - KENYA

VEGETATION MONITORING

Our implementing partners monitor vegetation in the landscapes. We can understand the impact of the interventions on the vegetation over time by measuring certain physical indicators, both inside and outside the vegetation areas. In the Amboseli landscape, we use the pin-frame method, carried out by our partner Amboseli Conservation Centre (ACC). This is a simple tool with ten pins more or less 30 centimetres long. The vegetation cover, greenness, and signs of grazing are assessed for the exact point of each pin after the tool is placed at random points within a monitoring location. The height of the vegetation beneath the pin-frame is then measured, which can be used to estimate biomass and grazing pressure. The monitoring is done across 20 permanent monitoring plots inside (14 plots) and outside (6 plots) grazing reserves.

Biomass monitoring reveals that the intervention areas maintain more green biomass during the rainy season than control areas. Although green biomass decreases to the level of control areas as the dry season approaches, total biomass remains higher throughout the year.
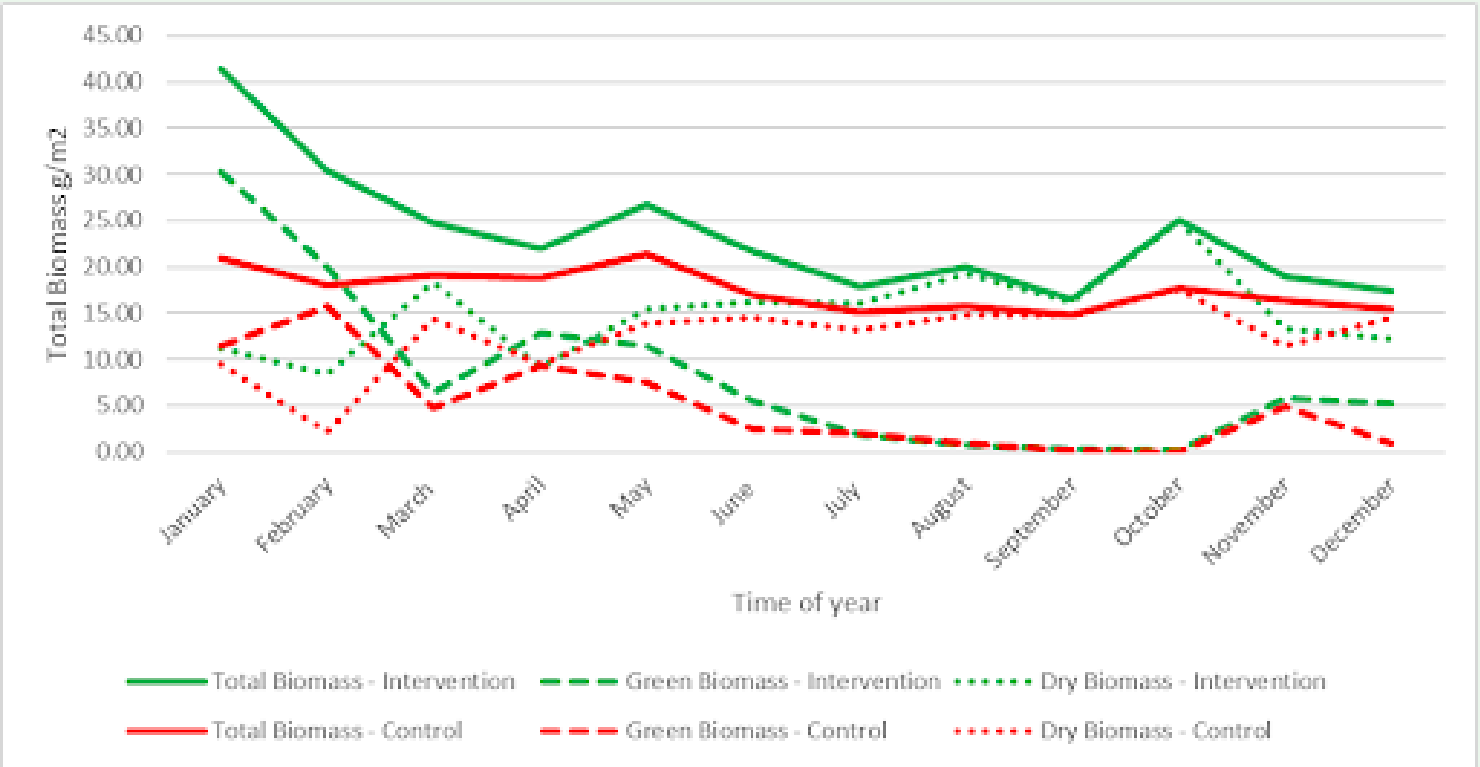
FIGURE 18: Total biomass in areas with interventions (intervention) and without interventions (control) in Amboseli.

In this analysis, we compared the average greenness for all grazing reserves with their direct surroundings that act as a control area. The relevance of grazing reserves can be seen in the significantly higher amount of biomass in the first quarter of 2022, when rains were already expected. This additional biomass is of high value for communities during the following months when available biomass in other grazing areas is diminishing fast.

AMBOSELI - KENYA

LIVELIHOOD BENEFITS

GRASS SEED BANKS

In the Amboseli landscape, there are three different active grass seed banks: Meshenani, Lenkism and Noonkotiak. Together, they cover an area of 28,7 hectares and were established in 2021. In 2022, the emphasis was on maintaining and monitoring these active grass seed banks, as well as strengthening and engaging women groups to increase ownership and proactive participation.

Grass Seed Bank	Women	Hectares
Meshenani	26	11
Lenkism	37	9
Noonkotiak	26	8.7
Total	**89**	**28.7**

TABLE 1: The area and the number of women, by grass seed bank, in Amboseli.

Although the grass seed banks did not produce enough seeds to be sold due to the lack of rains, the women groups started earning some income from the grass seed banks through selling hay, monitoring the grass seed banks and working on rainwater interventions. Women also reported that their full households benefited from the increased household income.

Although the rainfall and thus the harvest of grass seeds is still limited, the women were inspired to create other sources of income from the grass seed bank. From the exchange visit to Kuku they learned that "hay is an enterprise and that we can earn from this". They have created several sources of income, one of which is the controlled allowance of livestock in the grass seed banks. Initially, they did not let livestock in. Now they allow it with a small charge per cow. Women also gain some income from maintaining (e.g. digging the bunds) and monitoring the site. Each day, another group member is monitoring the site and earns some income from this.

The women of the Meshenani grass seed bank reported being inspired and motivated by seeing the grass seed bank in the Chyulu landscape during the exchange visit: "if rains come in good time, an area can be restored easily". "We have less worries when we see bare ground, we now know it can be restored, and even gain some income".

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CHYULU - KENYA

2. DEEP DIVE IN THE LANDSCAPES

CHYULU - KENYA

**Partners:** Maasai Wilderness Conservation Trust (MWCT)

INTRODUCTION

The Chyulu Landscape is located within the Tsavo-Amboseli ecosystem in Southwest Kenya at the foot of Mount Kilimanjaro and the Chyulu Hills. Kuku Group Ranch, where we have been working for the last 8 years, is located within the Chyulu Landscape. It covers an area of 1,200 square kilometres and is home to about 30,000 people, who by and large depend on the land for their livelihood. The majority of them are Maasai. Maasai are traditionally pastoralists and live in scattered semi-permanent villages or bomas, but are also diversifying their income sources. The is an important wildlife corridor between the national parks (Tsavo West, Chyulu Hills and Amboseli National Park) and other protected areas in the region. There is extensive land degradation in this landscape, driven by poor grazing practices and management, and climate change.

To restore the land, we focus on the implementation of rainwater harvesting interventions and improved grazing management. Grass seed banks are established to provide good quality grass seeds for restoration and for Maasai women groups to generate additional income.

The highlights for Chyulu in 2022

- We are proud to report that we have dug 109,500 bunds in the Chyulu landscape in 2022. This is almost 3 times more than last year! These bunds bring a total of 1,066 hectares of rangeland under restoration. This is important because the area is very degraded and really in need of being restored. The only challenge we are facing is that it hasn't rained as much as we had hoped in 2022 so the progress of the vegetation recovery is slower than expected.
- We extended our restoration efforts to the neighbouring Rombo Group Ranch. We are proud of that because it shows that the work we did in Kuku Group Ranch inspired other communities to do the same.
- A tomato farmer in Kuku Group Ranch converted his own land into a restoration site by digging bunds – a project initiated and implemented by himself! Again, it shows that the work that we are doing is inspiring the wider community to take up restoration initiatives themselves, which is a very positive development.
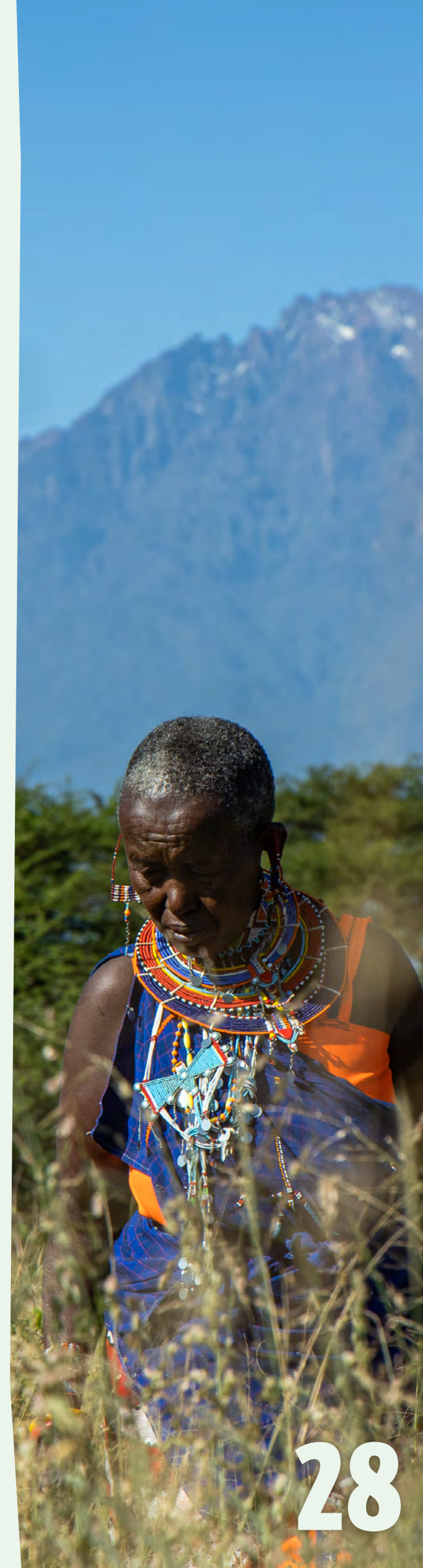
CHYULU - KENYA

LANDSCAPE RESTORATION

RAINWATER HARVESTING WITH WATER BUNDS

Land degradation in the Chyulu hills occurs in a vicious cycle, as is often the case. Natural vegetation is gradually disappearing and is unable to regenerate due to overgrazing and unsustainable grazing management. High-quality perennial vegetation disappears, leaving only low-quality annual vegetation. During the dry season, these die off, leaving the landscape bare until the first rains arrive. Because of the lack of vegetation cover, the soil hardens and becomes less permeable, significantly reducing infiltration during the next rainy season. More runoff occurs, frequently resulting in massive erosion and further land degradation, leaving less rainwater in the soil and allowing for even less vegetation growth during the following growing season. To address this issue and reverse the degradation process, tens of thousands of bunds are being dug in these degraded areas.

In 2022, we constructed a total of 109,500 water bunds, bringing 1,066 hectares of degraded rangelands under intensive restoration. This has doubled the number of bunds and area under restoration in this landscape, to a total of 259,548 bunds, covering 2,125 hectares.

Name of Bund Plot	Area (ha)	Bunds
Ilchalai	153	42,200
Olorika Phase I	178	18,600
Olorika Phase II	271	14,400
Rombo	464	34,300
Total 2022	1,066	109,500
Chyulu Total	2,125	259,548

TABLE 2: Area and number of bunds, per bund plot.
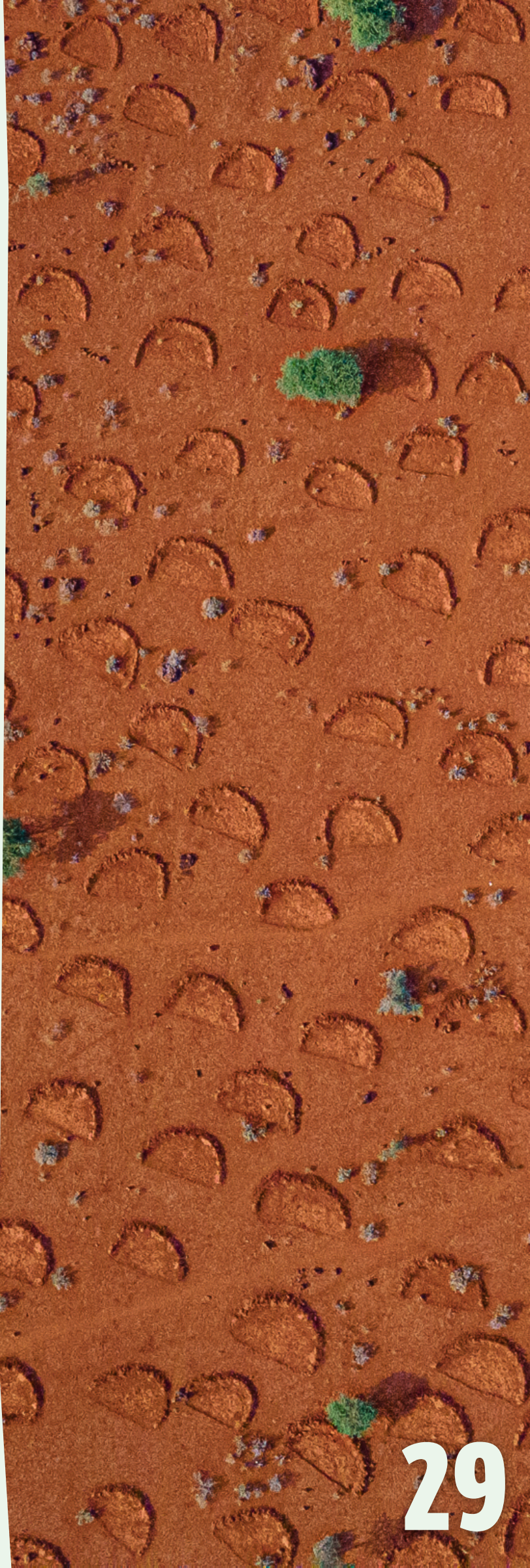
CHYULU - KENYA

LIVELIHOOD BENEFITS

GRASS SEED BANKS

In the Amboseli landscape, there are three different active grass seed banks: Meshenani, Lenkism and Noonkotiak. Together, they cover an area of 28,7 hectares and were established in 2021. In 2022, the emphasis was on maintaining and monitoring these active grass seed banks, as well as strengthening and engaging women groups to increase ownership and proactive participation.

Grass Seed Bank	Women	Hectares
Olkaria	22	3.7
Enkusero	22	3.5
Moilo	10	5.1
Inkisanjani	15	2.2
Enkii	15	3.9
Total	**84**	**18.4**

TABLE 3: The area and the number of women, by grass seed bank, in Chyulu.

VOICES FROM THE FIELD

"My name is Namelok Kanyakua, I am 36 years old, from Kuku Group Ranch, I am a digger in the Olorika Justdiggit project. As a Maasai woman and a mother, I am able to send my kids to school and buy food for my family using the money I get paid from digging the bunds. My husband left home to the Kamba land in search of pasture with a few livestock that is left, as many died due to this drought. I want to take this opportunity to thank Justdiggit for standing with us as women during this very difficult situation. I also believe when it rains the grasses that we have seeded will grow and our land will be green as it used to be when I was young. We will then be able to get milk for our kids."

"My name is Benjamin Leshinga. I'm a Justdiggit Olorika fundi (bund site supervisor), I am 29 years old and a community member from Olorika. The bunds digging project is supporting us during this very difficult time as we are experiencing drought and through the project we buy food for our families and even other community members with the money we get paid for the digging. The project has been a big relief to the Maasai community during this drought period. As a youth I have gained knowledge on how to educate the other community members how to restore and protect our land. I have also seen the benefits of conservation which I didn't know before I got engaged in this project."

"My name is Kishoiyan Alex. I am 27 years old. I am Justdiggit Head Fundi (bund site supervisor) and I am from Kuku Group Ranch, Langata village. This is now my fourth year working with Justdiggit on a project and besides the financial support that I get through employment, I have also learned a lot about the techniques used to collect rainwater. I am also happy to be part of the community members who are restoring their land."

"My name is Lanoi Meitiekini working with Maasai Wilderness Conservation Trust as the livelihoods department team leader. Maasai Wilderness Conservation Trust is the Justdiggit implementing partner for restoration works in Kuku and Rombo Group Ranches. The restoration interventions have been a game changer to the livelihoods of the Maasai community not only economically but also bringing back the lost vegetable cover in our landscape. Unlike before, the Maasai women working in the grass seed banks can support their families with basic needs like food and shelter through the income they get from the sale of seeds and hay thus earning respect from the men and the society at large. The grass seed banks have acted as demonstration sites to the community members to come learn and source seeds for the bunds at a larger scale."

CHYULU - KENYA

VEGETATION GREENNESS

In the Chyulu landscape, we constantly monitor the effectiveness of our intervention in regreening the landscape. With the help of satellite data (Sentinel 2 MSI), we assess the changes in the greenness of the intervention sites. We assess the vegetation cover and express this on a scale from 0 to 1, with 0 being completely bare, and 1 representing full vegetation cover. Figure 19 indicates a relative change in vegetation greenness in the Moilo grass seed bank area established in 2015. The upward trend in the relative change in greenness is evident across the years, except in 2020, with an 18% relative change.

Despite low precipitation, the Moilo grass seed bank was on average 69% greener compared to the surrounding area in 2022! This shows that the grass seed bank as an intervention had a significant impact in regreening our intervention area. Looking at the Kuku B Bund Plot intervention area that began in 2016, the vegetation greenness increased as well, as displayed in Figure 20.

These insights confirm the role of our interventions in enhancing vegetation growth through water retention and increasing water infiltration into the soil. If the soil retains more water, more water is available for vegetation.
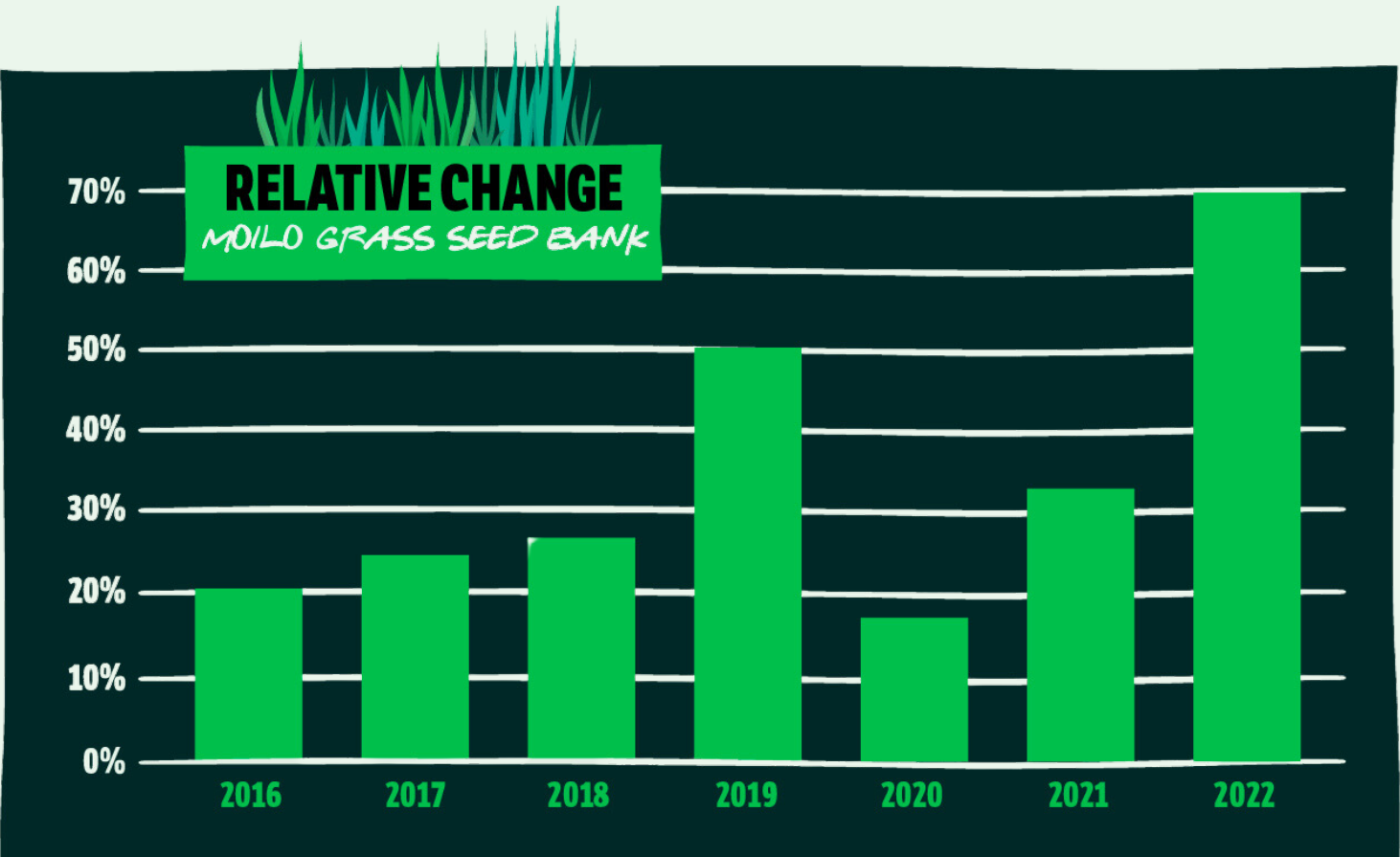
FIGURE 19: The difference in greenness (which indicates vegetation cover) in Moilo Grass Seed Bank relative to the surrounding area, by year.
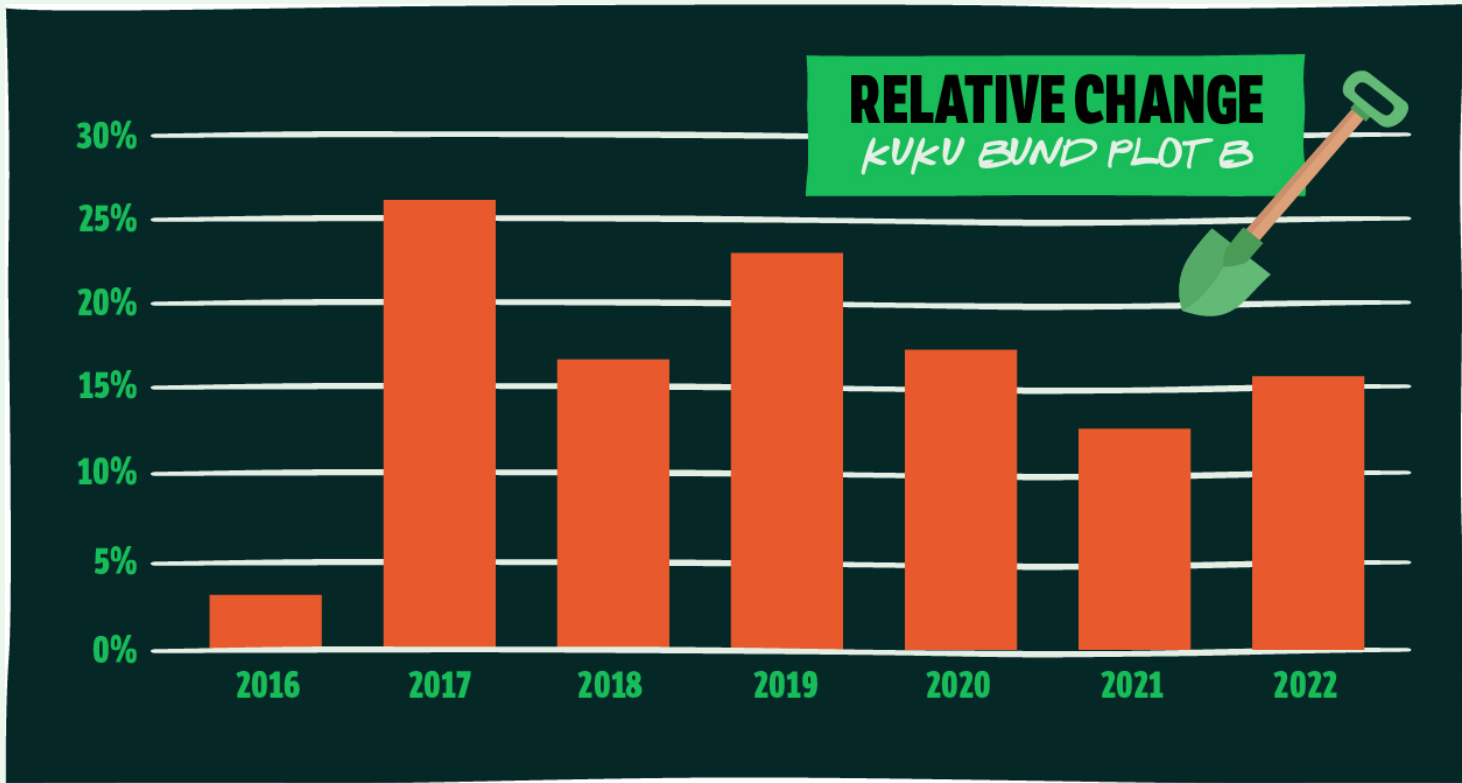
FIGURE 20. The difference in greenness (which indicates vegetation cover) Kuku Bund Plot B relative to the surrounding area, by year.

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SOUTH RIFT - KENYA

SOUTH RIFT - KENYA

Partners: South Rift Association of Land Owners (SORALO)

INTRODUCTION

The South Rift Landscape is part of the East African Rift Valley and is located in the south of Kenya, close to the border with Tanzania. The area sits adjacent to two large wildlife reserves: the Serengeti-Mara and the Great Kilimanjaro-Amboseli-Tsavo and supports some of the richest mammal diversity in the world. It's home to Maasai pastoralists: a nomadic or semi-nomadic community whose main source of income is livestock keeping. Together with partner SORALO, we help to restore degraded rangelands in the area, which play an important role in the wider ecosystem of the South Rift.

Highlights for South Rift in 2022

- We saw good results from the exchange visits we organised to the Chyulu landscape and Baringo County. The exchange visits focussed on grazing management, rainwater harvesting, grass seed banks and Prosopis removal.
- Rainwater Harvesting: The new rainwater harvesting interventions implemented were already functioning as they should. Especially with the little rains received, the harvested water was important for the landscape.
- Grazing management: The community is already respecting the restoration sites and is protecting them from grazing. The water pans are already contributing positively to grazing management as livestock are not degrading other areas just to look for water.

SOUTH RIFT - KENYA

LANDSCAPE RESTORATION

#### PHYSICAL RESTORATION INTERVENTIONS

Together with our partner SORALO, 51 new hectares of land in four different designated areas in the South Rift area were brought under restoration. The areas were established in Oldorko, Embirika, Ilgoso Loonkishu, and Lenkobei. Water bunds and water trenches were dug within those four areas to prevent further erosion, and grass seeds were sown for revegetation. New livestock routes were agreed upon and established by these communities to protect the restoration areas from livestock trampling and grazing. The project began in a small area to determine which interventions worked best and what additional lessons could be learned.

In the four restoration sites of the South Rift, 2,209 water bunds and 767 water trenches were dug for water retention and to reduce soil erosion. To slow down water runoff and reduce soil runoff, stone lines were established on slopes in three locations in Embirika Valley, and a check dam was established at five different locations along a seasonal stream. In November 2022, the bunds, trenches, and check dams were effectively holding the water during the first rains. After the rains, the bunds and trenches were filled with water, and the dams remained in place. The soil and branches trapped by the dams show that the water passed through but was slowed, as intended.

In Lenkobei and Oldorko, we restored existing water pans. The soil that was taken into the water pans by erosion was removed to restore the water-holding capacity of the pans. High water runoff washes the top soils away, which settles in these pans, reducing their water-holding capacity and the amount of water available for the livestock. Therefore, desilting the water pans is not only important in the context of drought management but also increases the number of water points with drinking water for the livestock, reducing grazing pressure.

As an example, compare these before and after pictures. To reduce future siltation, we constructed water retention interventions on the slopes and aim to increase the vegetation cover upstream to reduce runoff. Besides the desiltation of the existing water pans, we constructed several new ones in Oldorko and Lenkobei. The water pans have been crucial to the community: according to the testimonials, the pans could hold more water even with little rainfall. With one rainfall event, the water could serve the community for one to two weeks more than the normal days. Albert Kuseyo, the community Liaison Officer for SORALO, outlined that the grazing pressure was significantly reduced with an extra one or two weeks of water availability in the water pans. This was due to less movement of animals in search of water.
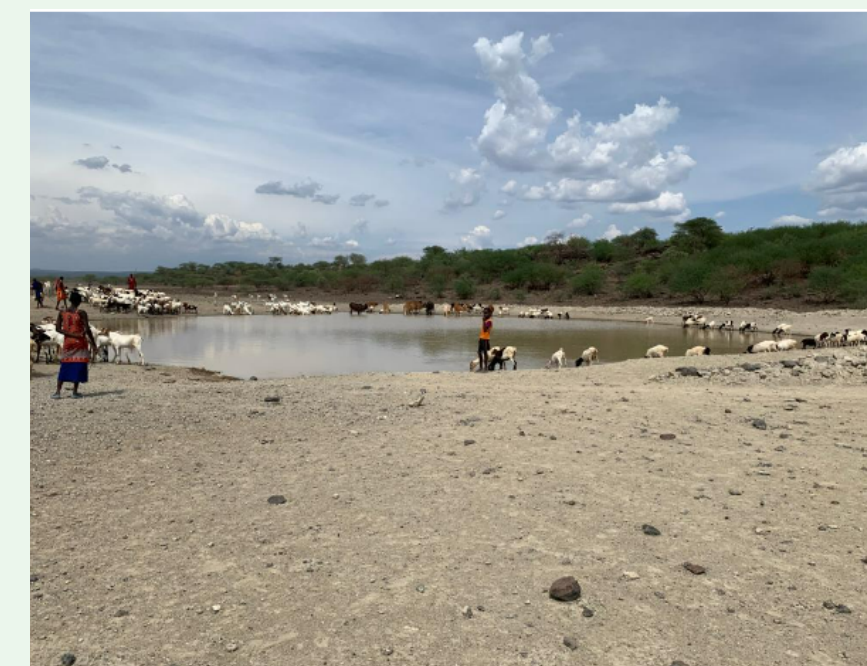
Picture: The water pan filled with silt (and thus less capacity to hold water) left, and the water pan after silt was removed (and thus increased capacity to hold water for the livestock) right.

SOUTH RIFT - KENYA

Picture: Check dam showing signs that the water flow was slowed during the rains.

GRAZING MANAGEMENT

After establishing the new restoration sites, such as the bund sites, it was important to take action to protect the sites from grazing. Grazing committees have an important role in protecting the restoration sites from grazing. To learn from the grazing committees in our older bund sites, 6 grazing committee members went for an exchange visit to the Chyulu landscape. We also organised training and workshops to build awareness and capacity in the communities. 117 community members participated in a workshop on land restoration and communal land use and 16 leaders participated in a workshop on governance and land restoration. In November 2022, several community members were appointed by the community. They will be supported by SORALO to guard the plots.

REMOVING INVASIVE SPECIES IN SOUTH RIFT

One of the main problems in the South Rift Region is the encroaching of invasive plant species which leads to the loss of rangelands. The most common invasive species found in the project area is Prosopis Juliflora. These species often take over in degraded areas and outcompete the vegetation that should be present: grass and shrubs species that can be eaten by livestock and wildlife. That's why restoring these landscapes is so crucial! We're currently exploring various methods of Prosopis removal and utilisation in order to restore and make room for better vegetation types in our project areas.

LIVELIHOOD BENEFITS

Community engagement is an important pillar of the program. From South Rift, 24 community members participated in the exchange visit to learn from the project sites and communities in the Chyulu landscape. Community members who were interviewed during our monitoring visit in November 2022, mentioned the importance of the exchange visits. They expressed that they felt motivated by seeing the more long-term effects of the restoration work. Our partner SORALO also noticed increased commitment and motivation at the project sites. They mentioned that during the digging process, in the morning after the rains, the people were running to the site to see if the water bunds were filled with water.

The main livelihood benefit of restoring the grasses and other vegetation on bare soils can only be seen in the long term, when communities have access to grass to feed their livestock. In the short term, the program provides an additional source of income. In 2022, 254 community members directly benefited from additional income by being paid for their labour, while digging water bunds and establishing other physical restorations. Based on the average household size, we can estimate that the project has benefited 1,500 people so far. During the monitoring visit the interviewees also expressed that the project has been important for supporting their livelihoods. The small income from digging the bunds and trenches supports their livelihoods in difficult times of drought.

NORTHERN TANZANIA

NORTHERN TANZANIA

Partners: LEAD Foundation, TRIAS, MVIWAMA, MVIAARUSHA, Pastoral Women's Council

INTRODUCTION

There are two main projects in the Northern Tanzania landscape, one of which is the Regreening Arusha Program (RAP). This started in 2021 in collaboration with LEAD Foundation and Erbacher Foundation. With the program, we aim to improve degraded landscapes through Pastoralist Managed Natural Regeneration (PMNR) and harvesting rainwater by digging water bunds. These techniques lead to the improvement of grazing areas. The project is implemented in six villages in the Monduli district: Engaruka chini, Selela, Baraka, Esilalei, Meserani juu and Mungere.

In addition, we collaborate with several member-based organisations under the umbrella of partner organisation Trias to implement the INCLUDE program. This is also known as the HUSISHA program in Swahili. The program aims at improving the capacities and services of the member-based organisations Mtandao wa Vikundi vya Wakulima na Wafugaji Mkoa wa Arusha (MVIWAArusha), Pastoral Women's Council (PWC) and Mtandao wa Vikundi vya Wakulima na Wafugaji Mkoa wa Manyara (MVIWAMA) by including women, men, youth and underprivileged to attain sustainable development. Among other components of the program, we ensure restoration of agricultural and grazing lands, together with the LEAD Foundation. Geographically, the HUSISHA program is being implemented in the Hanang', Babati and Kiteto districts in the Manyara region, and the Arusha and Monduli districts in the Arusha region. HUSISHA is a 5-year program, running from 2022 to 2026.

Highlights in 2022

- We signed a collaboration agreement with Trias Tanzania for the implementation of the HUSISHA program. This is important for the expansion of our presence in the country and landscape in general. It also led to a working relationship with new local partners MVIWAARUSHA, MVIWAMA and the Pastoral Women Council.
- We kicked off the HUSISHA program in Northern Tanzania (Arusha and Manyara regions). This is an important development for our expansion in the country. It means we can improve socio-economic circumstances for more farmers and pastoralists, and positively impact nature and the climate.
- Our team grew as well: we hired a Landscape Manager Tanzania, stationed in Arusha.

NORTHERN TANZANIA

LANDSCAPE RESTORATION
BUNDS & TRENCHES

In 2021, a total of 22,000 bunds were constructed as part of the Regreening Arusha Program. In 2022, 905 water bunds were constructed by the communities as part of the HUSISHA program, covering an area of about 4 hectares. Moreover, 222 water trenches were dug, covering a distance of over 7,202 metres. One of the vital tasks performed in 2022 was the protection of the bund sites from encroachment of wild animals as well as domesticated animals. Each village assigned security guards for protection. Because of the large-scale implementation of half-moon bunds, several community members have been inspired and activated to construct them on their own private land. This is a result of training by champion farmers and participating in digging half-moon bunds on communal grazing lands. The project district coordinator and the champion farmers assisted the farmers with observing standards and measurement so that they got them correctly. Until now, hundreds of half moon bunds were dug on community members' private farms by community members themselves.

NUMBER OF TREECOVERY TREES

We use a farmer-to-farmer training system to reach and engage as many farmers as possible for our Treecovery projects. Firstly, several champion farmers are selected in each program village. They receive thorough training by our implementing partners. A training session takes about a week and elaborates, besides the technique itself, on leadership and training skills. The champion farmers then return to their villages to train other farmers, of which 1,999 have started actively practising treecovery! So far 19,965 tree stumps covering 2,801 hectares have been reported to be protected and regenerated into trees.

2. DEEP DIVE IN THE LANDSCAPES

NORTHERN TANZANIA

LIVELIHOOD BENEFITS

The programs benefit the livelihoods of community members in our project areas. The champion farmers are benefiting from the extra skills acquired through training. The members of Mviwaarusha and Mviwama, and the community at large, are also benefiting from training in easy-to-apply landscape restoration techniques. In the longer term, they will benefit from the trees and grasses that are growing back through treecovery and water retention.

GRASS SEED BANKS

A total of 100 women from local communities have received their first training on setting up and managing their grass seed bank. Suitable areas for four grass seed banks have been identified and mapped, covering a total of 16 hectares.

VOICES FROM THE FIELD

Christina Alameroi, 55 years; women chairlady, Losirwa village.
"We are very happy to receive this project to our village as pastoralist women, the project comes at the right time and it is really helping people in need, this is like a thirsty person surprised with a drop of water in the middle of dessert. As women chair ladies we are grateful for this and we thank you, the organisation leaders and entire PWC team, for thinking of us and bringing the project that touches our lives. From the different interventions introduced during the inception meeting, we have received the project with all of our hands and ensure our supporters that we will make use of this opportunity."

Joyce Noah, 72 years, a mother of four and a farmer, Ekenywa village in Meru district council – Arusha Region. "I am happy to be introduced to this program that has helped me to shape my farm and improve my activities. We were in a very bad situation of water scarcity, without pastures for the livestock. Since MVIWAARUSHA introduced to me this technique of constructing Fanya Juu, Fanya Chini, I have harvested water and my farm has enough grass that helped me to overcome the drought for my livestock"

Boniphace Tarakwa: 64 years, a father of 7, lives in Losikito Village in Arusha district council in Arusha region. "I wonder why I received this skill very late, I am now comfortable with farming on my land regardless of any weather situation. At both my farm at home and the one which is away from home, I have applied this technique"
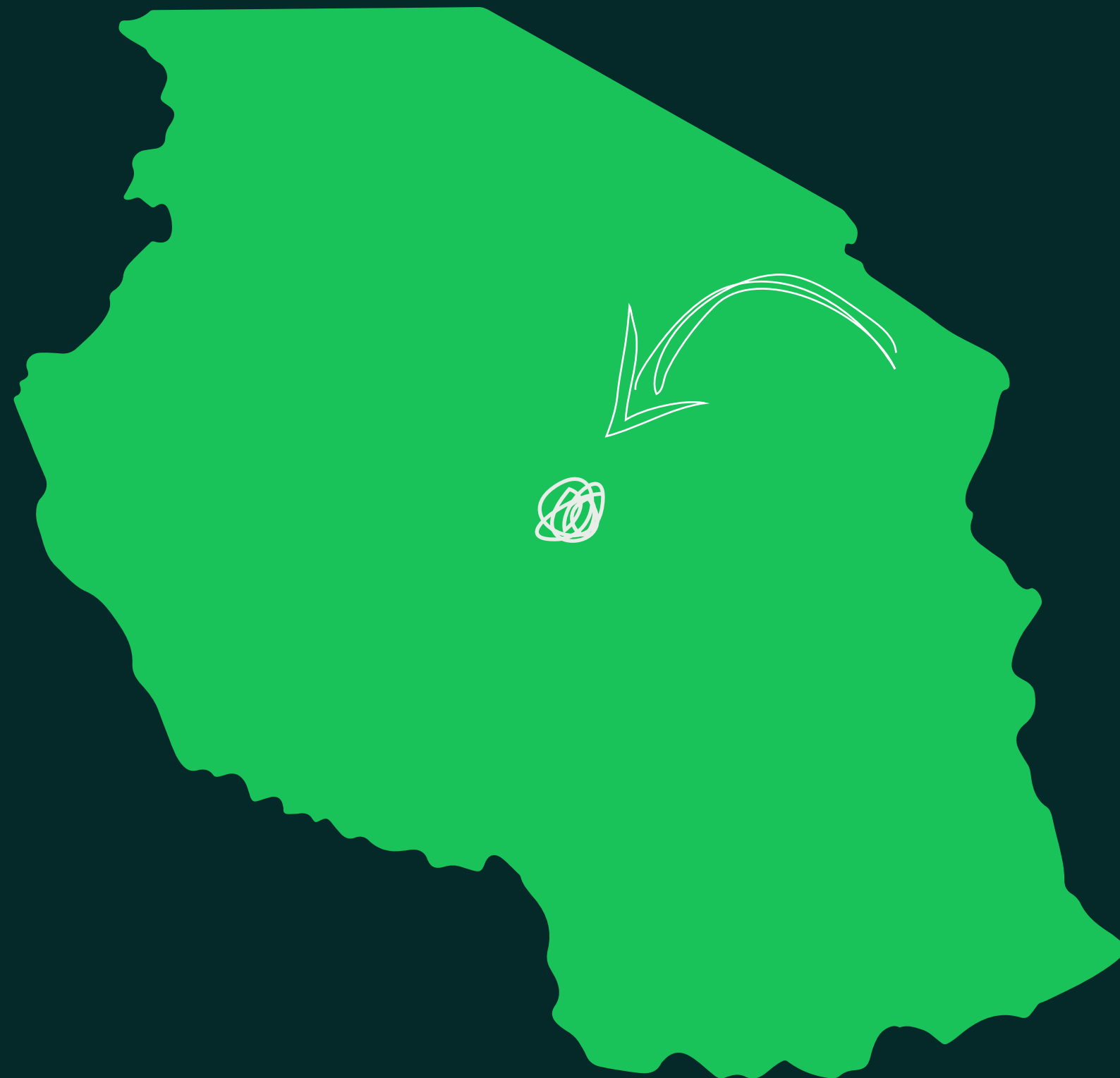
Naseriani Naile: 48 years, a father, and a pastoralist living in Emurwa village in the Monduli district in the Arusha region. "This half-moon bunds technique has come at the right time when I believe we need it the most and I believe it will help us in terms of harvesting water and having enough grass for our livestock"

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CENTRAL TANZANIA

CENTRAL TANZANIA

Partners: LEAD Foundation

INTRODUCTION

The Central Tanzania landscape is mainly characterised by smallholder farming, with some smaller areas where livestock keeping is more common. Due to unsustainable land management and farming practices, land degradation is common. The region has also been heavily deforested to make room for expanding agriculture. In this landscape, we focus on bringing back trees on and around farms with Farmer Managed Natural Regeneration (FMNR). With this pruning technique, stumps of cut-down trees can mature into real trees again – and regreen the area in a much quicker and more sustainable way than if we would plant new trees! Besides promoting the regeneration of trees, we also teach farmers how to make more efficient use of the available water by implementing rainwater harvesting interventions.

The program in Central Tanzania started in 2017 as a pilot, with 66 villages in the Kongwa district in the

Dodoma region. In 2018, the program was scaled up to the whole Dodoma region, targeting half of the villages in every division; a total of 341. In 2021, the program was expanded to the neighbouring Singida region, where we are currently working in 140 villages. This brings the total number of program villages in the Central Tanzania landscape to 481. The long-term goal for this landscape is to reach 1,000 villages by 2030!

In every village, the program starts with a 3-year intervention phase, where we aim to reach as many land users as possible. Besides working with champion farmers, we do this through several rural communication channels, such as radio shows, movie roadshows and an SMS service, to inform land users about treecovery and activate them to join the regreening movement. After the intervention phase, we gradually scale down the activities, while closely monitoring the sustainability of the impact made. This phase is all about maintaining the trees that were brought back to make sure the program made a lasting impact.

Highlights in 2022
- We launched our 'Central Tanzania 2030 vision': the scaling up of treecovery to 1,000 villages. This is important in defining our general objective for the regreening of our planet!
- We added 74 villages in Central Tanzania: 43 villages in Cluster B1 and 31 in Cluster B2. This is an important milestone towards reaching our 2030 vision.
- The design and implementation of our first sustainability phase, in the Dodoma region. The first evaluation of the sustainability phase shows that farmers are keeping their trees and are still committing to treecovery!

CENTRAL TANZANIA

LANDSCAPE RESTORATION

TREECOVERY

The selection and training of champion farmers is the first step in promoting and implementing treecovery. We have trained about four farmers in each village to be our champions and local ambassadors of the program and regreening movement. During their training, champions learn the fundamentals of regreening and treecovery and practise pruning trees together to ensure they master the skill. They then learn how to communicate this message to others, how to organise training with groups of farmers in their own villages, and how to properly monitor and track progress. After this first training series, the champions return to their villages to begin training others and spreading the regreening movement in their own villages. After the first and second years, they attend another training session where they learn more advanced skills, such as how to best utilise the trees so that they are most beneficial to farmers.

In 2022, a total of 27,603 farming households in Dodoma and Singida were trained. 88% of them, 24,403 households, began practising treecovery on their land. In addition, champion farmers educate institutions such as churches, mosques, health clinics, schools, and other landowners. The organisation AwakenTrees supports the movement with their Kisiki Hai 4 Schools program by developing cartoons and other awareness-raising tools that promote treecovery and sustainable management of trees in almost 40 primary and secondary schools in the program area. In 2022, 510 institutions had been trained, with 502 of them adopting treecovery – an adoption rate of 98%! In 2022, institutions and households had regenerated 4,206,273 trees, bringing the total number of trees at the end of 2022 to 13.9 million.

As trees grow in size, their impact on their immediate environment grows. The immediate surroundings of a tree are increasingly affected as the size of its canopy and the reach of its roots grows. Less erosion will occur because the canopy intercepts rain and the root systems hold the soil together. Because of the improved soil structure, more water can infiltrate, and soil fertility can increase as a result of the added organic material and increased biological activity. To calculate the area under restoration, we distinguish between the area under intensive and the area under extensive restoration. To calculate the area under intensive restoration, we assume a circle with a radius equal to the tree's height around each tree, in which the tree has a physical effect on its surroundings.

The area under extensive restoration, is based on the farm size of all activated households. This is the farm area that is under more sustainable land management as a result of the regreening program's efforts. In 2022, an additional 56,619 hectares of farmland was subjected to extensive restoration in the Central Tanzania landscape. By the end of 2022, the area brought under restoration was 364,597 hectares.

Last year, the Dodoma region entered into the sustainability phase. In this phase, the focus shifts from active implementation to maintaining the realised impact. Of course, we still aim to increase the impact made, but the main focus is on ensuring a long-lasting impact of our interventions. The sustainability phase started in January 2022. After almost a year, in December 2022, we collected data for the first extensive evaluation where we interviewed 281 households. Although the evaluation is not finished yet, the first analysis of the data is very positive! It shows that treecovery is still very relevant to farmers and their livelihoods. It also showed the commitment of farmers, with 98% of the interviewees planning to continue practising treecovery in the next 5 years.

With the addition of 24,403 active farmers in 2022, over 152,000 households have brought trees back on their own land. The extent of regeneration varies greatly between farmers. Whereas some farmers decide to bring back 10 trees or less, some regenerate thousands. On average, every active household has brought back 78 trees. Institutions generally bring back more trees, with an average of 705, but also here the variability is large. In general, we see that farmers start small after they first get in touch with treecovery. After their first experiences, they start scaling up.

Woodlots play a big role in the variance of the tree count among households. Woodlots are pieces of land that are specifically designated for growing trees. By implementing these, farmers can easily bring back high numbers of trees, providing their households with a sustainable source of wood. Woodlots exist in many different shapes and sizes. Some contain a few dozen trees, while others count thousands. At the same time, not all farmers implement these woodlots.

CENTRAL TANZANIA

WATER TRENCHES

Farmers in Tanzania's Dodoma and Singida regions have implemented the water trenches techniques on their land. In 2022, a total of 4,235 water trenches were dug by the active farmers, totaling 18,968 metres.

Picture: The water trenches in full effect in Mungaa village of Regreening Singida Program

LIVELIHOOD BENEFITS

The program benefits champion farmers, local farmers, and local communities by allowing households to obtain tree products such as fruits, fodder, and firewood from their farms through treecovery. The program also aims to improve farm soil, retain water on farmlands and increase crop yields through the water trenches technique. Lastly, the program benefits institutions in the villages such as schools, dispensaries, churches, and mosques.

The evaluation done in the Dodoma part of the program in December 2022 showed that households implementing treecovery perceive a wide range of benefits. Most farmers have better access to a more sustainable source of firewood. Since treecovery is all about the sustainable use of trees and tree products, it discourages cutting down trees completely. Over half of the farmers report shade and windbreaks as a benefit, which ties closely together to an improved microclimate. Wind is, especially in areas with little natural vegetation, one of the main reasons for land degradation as fertile soils are being removed by wind erosion. Also, timber products, poles, food, nuts, fruits, building materials and medicinal products are direct benefits perceived. About one out of five farmers experience increased soil fertility through the recovered trees. This is to be expected: since these processes are very slow, it may take some years before the effects become apparent. The figure below shows the different benefits as perceived by farmers.
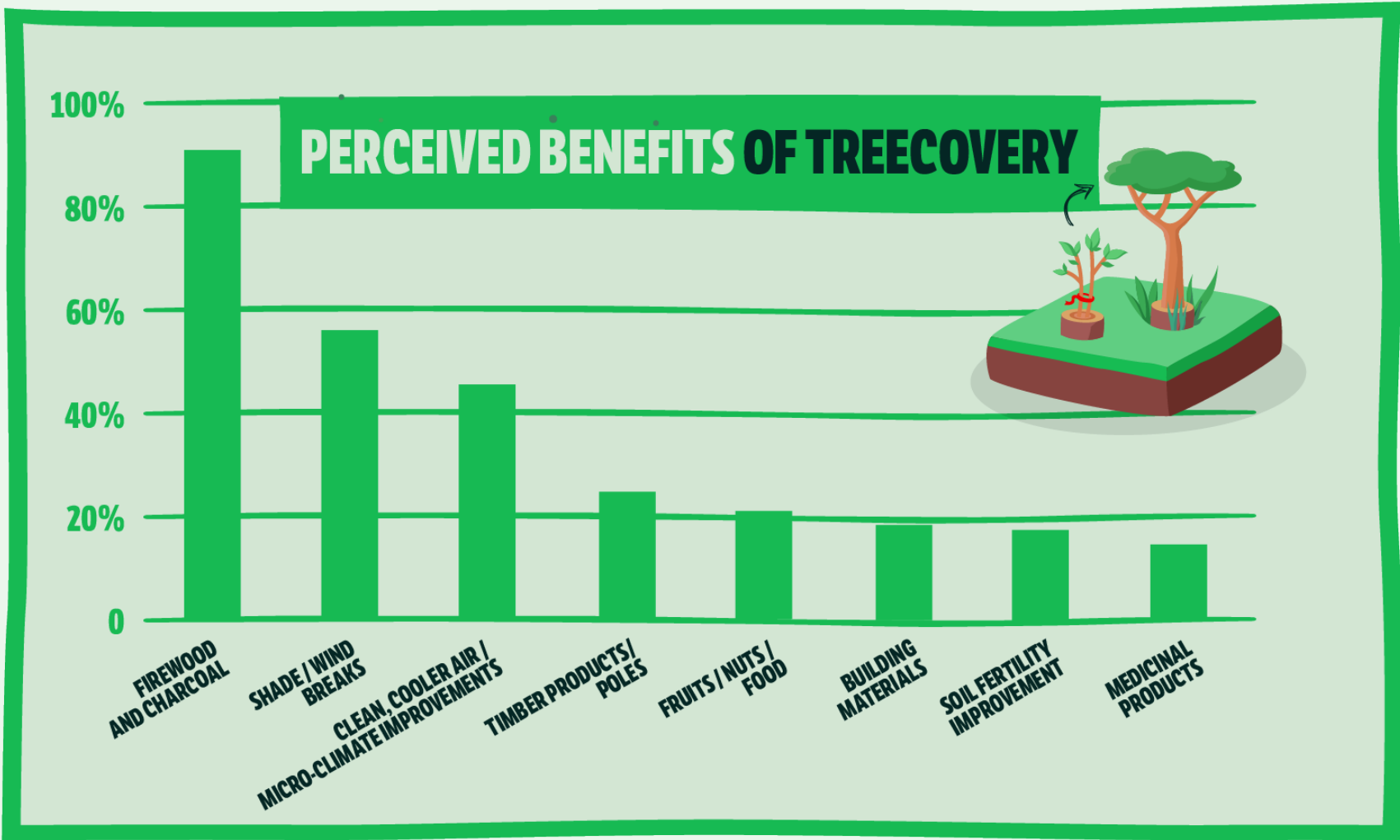

FIGURE 21: Proportion of farmers that mentioned each of the benefits.

CHAPTER 3

RESEARCH & INNOVATION

At Justdiggit, we are doing more than 'just digging'. We are also continuously monitoring and learning about what works best, and under what conditions. We always explore new and innovative ways to efficiently monitor and evaluate the effectiveness and scale of our work, like using drones, satellite images and mobile technology. The monitoring part of our work is a close collaboration between the Monitoring, Evaluation and Learning (MEL) & tech team, with cool innovative technology partners, such as Planet, ESA, Lynxx and Spatial Insight!

COUNTING TREES

14 Million trees. That is how many trees have been regenerated thus far in our Treecovery programs. At least, that's what we think!

We use a manual way of counting, where every single tree is counted. This makes our tree monitoring system generally reliable and precise, but, as with any manual system, there can be flaws. In 2022, we invested in verifying the number and size of the trees by an independent party. The good news is that the number of trees was confirmed by field observations. Even better, we found out that there are probably much more trees regenerated than we previously assumed. In this chapter, we will share some possible explanations, which we will further explore in the coming year.

OUR BOOKLET MONITORING SYSTEM

As explained before, every program village has about 4 champion farmers. Some villages have a few more and some less, depending on the village size. These champion farmers play an important role in our monitoring system. After training farmers, the champion farmers regularly revisit them, for further coaching and monitoring. Together with the farmer, the number of trees is counted during every visit. If possible, they do this one by one, but sometimes there are just too many trees to count them all. In these cases, they make an estimation. The champion farmers keep a detailed record of all these tree numbers for all farmers they have trained. To do this, they use a specifically designed booklet.

Every month, these champions calculate the total number of trained and activated farmers, and the total number of trees they regenerated. These cumulative numbers are then sent to program coordinators (district coordinators), who keep a database of hundreds of champions. District coordinators play an important role in verifying the reported numbers. It is their full-time job to regularly visit every project village in their region. They visit local leaders, organise events and follow up with champion farmers in every village. During these follow-ups, random farmers are visited and the reported numbers are double-checked with field observations.

VERIFYING THE NUMBERS WITH OUR OWN SOURCES

The LEAD and Justdiggit MEL teams regularly analyse the change in reported numbers over time. When suspicious cases are identified, such as extreme increases, or long periods without change, additional verification checks are done with the champion farmers. Another way of verifying our numbers is through the field verification reports of the district coordinators in our program, which are regularly submitted to the MEL team.

Field verification reports from district coordinators from the last few years confirm that booklet data is often underreporting the actual number of trees that are brought back. In about 56% of the reports, the observed number of trees by the district coordinators was higher than what was reported. The remaining 44% of the reports confirmed the tree count as reported in the booklets.

On average, during their field verification visits, district coordinators counted 27% more trees than the booklets reported. A possible explanation for this is a backlog in champion visits. Champion farmers train about 150 farmers, of which about 80% eventually start practising. These farmers all need to be visited, which takes a lot of time. Especially during the growing seasons – champions are also farmers! – there is not a lot of time to do these visits. This could lead to a reporting lag in the actual number of trees.

INDEPENDENT VERIFICATION BY FACE THE FUTURE

A second source for verifying our data is a verification project we did in October 2022, with an independent party, Face the Future. The main objective of this was to estimate the total amount of CO2 sequestered in the program, but it also served as a thorough verification of the reported trees. About 75 farms were randomly selected and visited and all trees were measured and counted. The first results were unexpected: they found three times as many trees in farms as were reported in the booklets. This would bring the estimated tree count in the Dodoma region to over 32 million! This clearly needed further analysis and interpretation, considering the big difference with our booklet system. A deep dive into the data already gave us two interesting insights that could possibly explain the difference.

Picture: Example of a woodlot

Firstly, it appears that trees that are regenerated in woodlots are often not reported. A woodlot is a designated piece of land that is purely used for growing trees, often in very high densities. As part of the program, we promote growing woodlots as they provide a sustainable source of wood for the household. Not all farmers apply this concept, and not all woodlots are the same. Some contain 30 trees that are well-pruned and have grown back into full trees, while some woodlots contain thousands of trees that may only have been pruned once, or not at all. The Face the Future assessment found that they are often not covered by our monitoring system. An explanation for this could be that these trees do not match the standard definition of a recovered tree, which is regenerated through the four steps of selection, pruning, marking and protecting. As these woodlots often contain thousands of trees, they play a large role in estimating the total number of trees in the program.

Besides underreporting the trees in woodlots, the number of trees on the farmland appeared higher than recorded in the booklets. This confirms the earlier-mentioned findings of district coordinators. Even in the most conservative analysis, where we only include manually counted trees in agroforestry plots, we found about double the number of trees on average compared to the booklet numbers. Booklets underreported the number of trees in 81% of the visited farms. For 54% of the farms, we found more than 50% more trees than the number reported in the booklets.

Both insights have great implications for the total number of trees in our programs. Although many data sources and qualitative insights point in the same direction, we choose to be consistent in our monitoring and reporting. Our verification efforts show that this means we are conservative in our communication. In the coming year, we will further investigate our monitoring system and make the needful changes to increase the accuracy. Until then, we can conclude with full certainty that our program thus far brought back at least (!) 14 million trees.

3: RESEARCH & INNOVATION

EXPLORING NEW METHODS: COUNTING TREES FROM THE SKY WITH LYNXX AND VU

Together with data science company Lynxx and VU University Amsterdam we have developed a machine learning model to count, monitor and track individual trees on farmland. By analysing drone and satellite imagery of our project areas in Tanzania, we are able to detect changes in tree numbers, tree crown size and tree cover over time. By comparing these numbers to areas where we are not active we expect to develop a scalable method to quantify the impact of our agroforestry programs. In the summer of 2022, together with Fruitpunch.ai, we hosted a hackathon where over 20 volunteers from all over the globe participated to improve the machine learning models and gain additional insights from the data. Click here to read more!

Picture: Identification of trees using the machine learning algorithm developed by Lynxx, using drone images collected in the Dodoma region

BUILDING AN INTERACTIVE DASHBOARD WITH SPATIAL INSIGHT

In 2022, we started a project with Spatial Insight to build a dashboard for managing the data from our Treecovery program in Tanzania. Spatial Insight is an independent Dutch data science consultancy. Instead of donating money, Spatial Insight decided to donate manpower to support Justdiggit with data management and building an insightful dashboard. The dashboard will help us to get even more insights from this data and further optimise the efficiency and accuracy of our monitoring data. The first version is ready, and we are already super excited to see what it can do. The project will continue this year. A big cheer to Spatial Insight for their fantastic support! Click here for more info.

VEGETATION MONITORING

The main goal of our rangeland restoration interventions is to bring back vegetation. To see whether our interventions are successful, we continuously monitor vegetation in our intervention areas. By comparing vegetation levels inside and outside the intervention areas, we monitor the relative change over time. Depending on the landscape and the implementing partner, we use slightly different methods, but they all focus on vegetation cover, biomass and grazing pressure. Most of the vegetation monitoring is done with a pinframe, a simple structure that has a number of long pins that, when placed on the ground, randomly touch the soil. By counting the number of pins that touch any vegetation, the total cover and biomass can be estimated. Repeating these measurements over and over gives a good indication of the vegetation levels of these areas.

However, not all vegetation is 'good'. It really depends on the intended use of an area. For instance, not all grasses or herbs are palatable for livestock and wildlife. An area covered by these species may look very good when analysing data from the vegetation monitoring assessment, but it is in fact useless as a source of grazing. The presence and dominance of certain types of vegetation can actually tell a lot about the ecological state of that area. Some species – called decreasers – are abundant under low grazing pressure but rapidly decrease when grazing pressure increases. Increaser I species can often be found in high numbers in under-utilised areas, whereas increaser II species are abundant in areas that are typically overgrazed, disturbed and generally degrading. Lastly, invaders can rapidly encroach into degraded areas and take over within a relatively short period. Identifying and classifying these species can provide valuable insights into the ecological status of the area.

In 2022, we started developing a methodology to use these characteristics to get qualitative insights about our intervention areas. A dedicated team of researchers from the Department of Natural Resources Management of Egerton University in Kenya conducted intensive vegetation sampling and species identification to develop this methodology. Together with biomass sampling using a pin-frame, their methodology assesses the ecological status of our intervention areas. Based on this assessment and the collected data, it provides concrete grazing advice to the end-user, which is very useful for us, our implementing partners and, most importantly, for grazing committees. In the end, especially after the implementation period, grazing committees have full ownership of the management of the intervention areas. That's why it is of great importance that they have the tools, resources and knowledge to make informed decisions about grazing pressure, to ensure that these areas do not start degrading again.
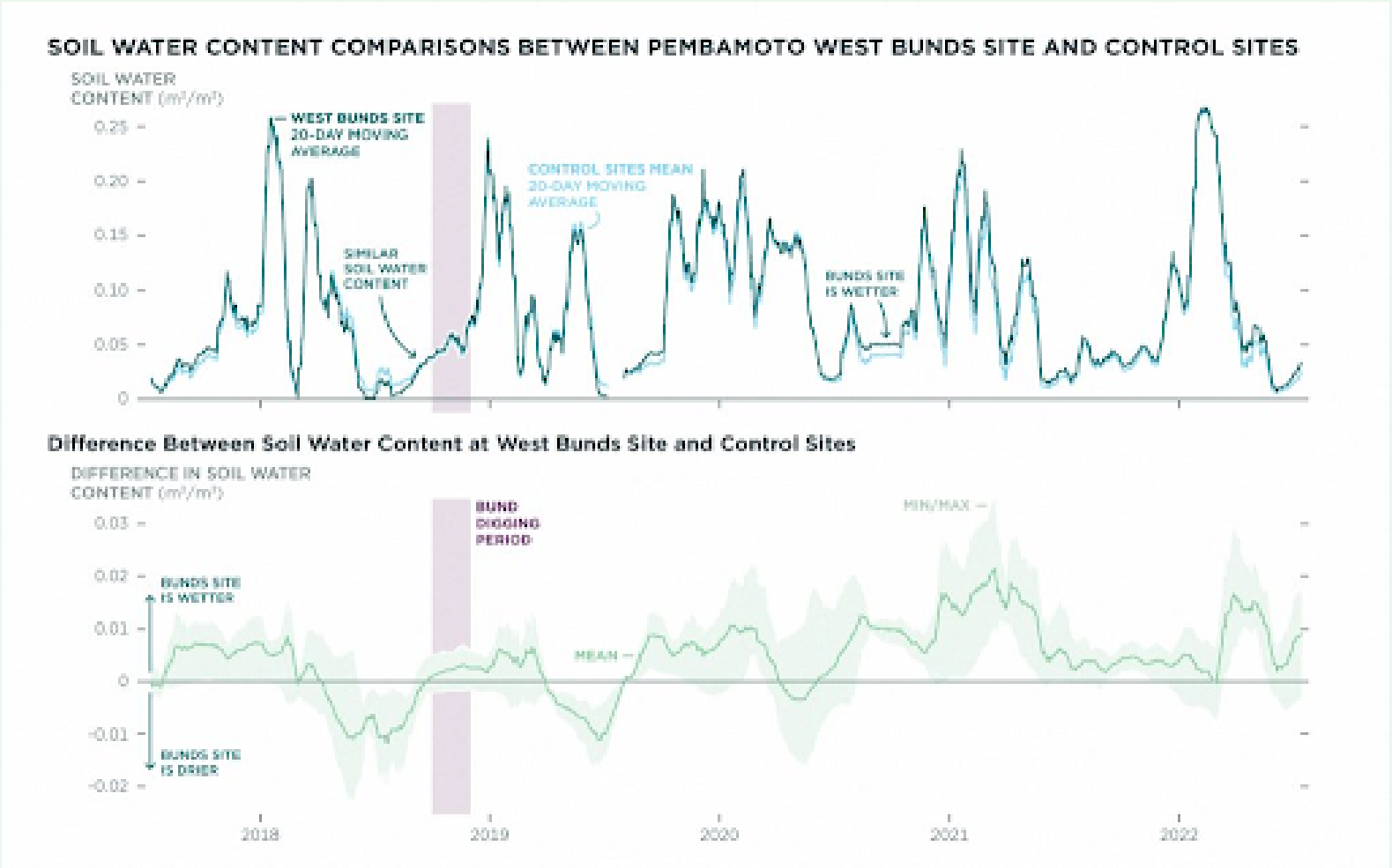
WATER RETENTION & MICROCLIMATE

PLANET & EUROPEAN SPACE AGENCY (ESA)

Satellite data has been an important tool for us to measure (and show!) our direct impact on the landscapes. In partnership with Planet, the University of Leicester, and the Planet & European Space Agency (ESA), we used complex satellite data to measure the impact of our interventions on water, temperature and vegetation. Using the satellite datasets, we have been able to observe clear indications of restoration effects in land surface temperature and soil water content when comparing our bund sites to 'control' sites where no interventions took place! The great thing about this approach is that it not only provides a scalable and independent way to monitor our impact in a scientific way. It also allows us to translate these insights into easy-to-understand metrics such as 'litres of water' and 'degrees cooling' as shown in this impact dashboard prototype.

FIGURE 22: Measured Soil Water Content in and outside the bund area in Pembamoto, Central Tanzania, from the micro-climate assessment tool developed by vanderSat and Planet.

MICRO-CLIMATE RESEARCH

To examine the impact of our intervention techniques on the local micro-climate of our intervention sites, our partner Meta Meta Research established a framework for data loggers in Meshenani Grass Seed Bank in February 2022. Because of excessive runoff in this grass seed bank and the danger of a serious gully developing, water bunds were dug inside the seed bank. This made the Meshenani seed bank a great case study! The study aimed to measure the impact of the grass seed bank and the bunds dug within on the local microclimate, particularly on soil moisture and temperature. To get insights, the sensor measurements placed inside and outside bunds were compared. Figure 23 shows variation in soil temperature with day and night sinusoidal (wave) patterns present. Both inside and outside the bunds, temperature values show the same time lag. The temperature inside the bunds was 2.36 degrees Celsius lower than that outside bunds. You can find more information about the research here.
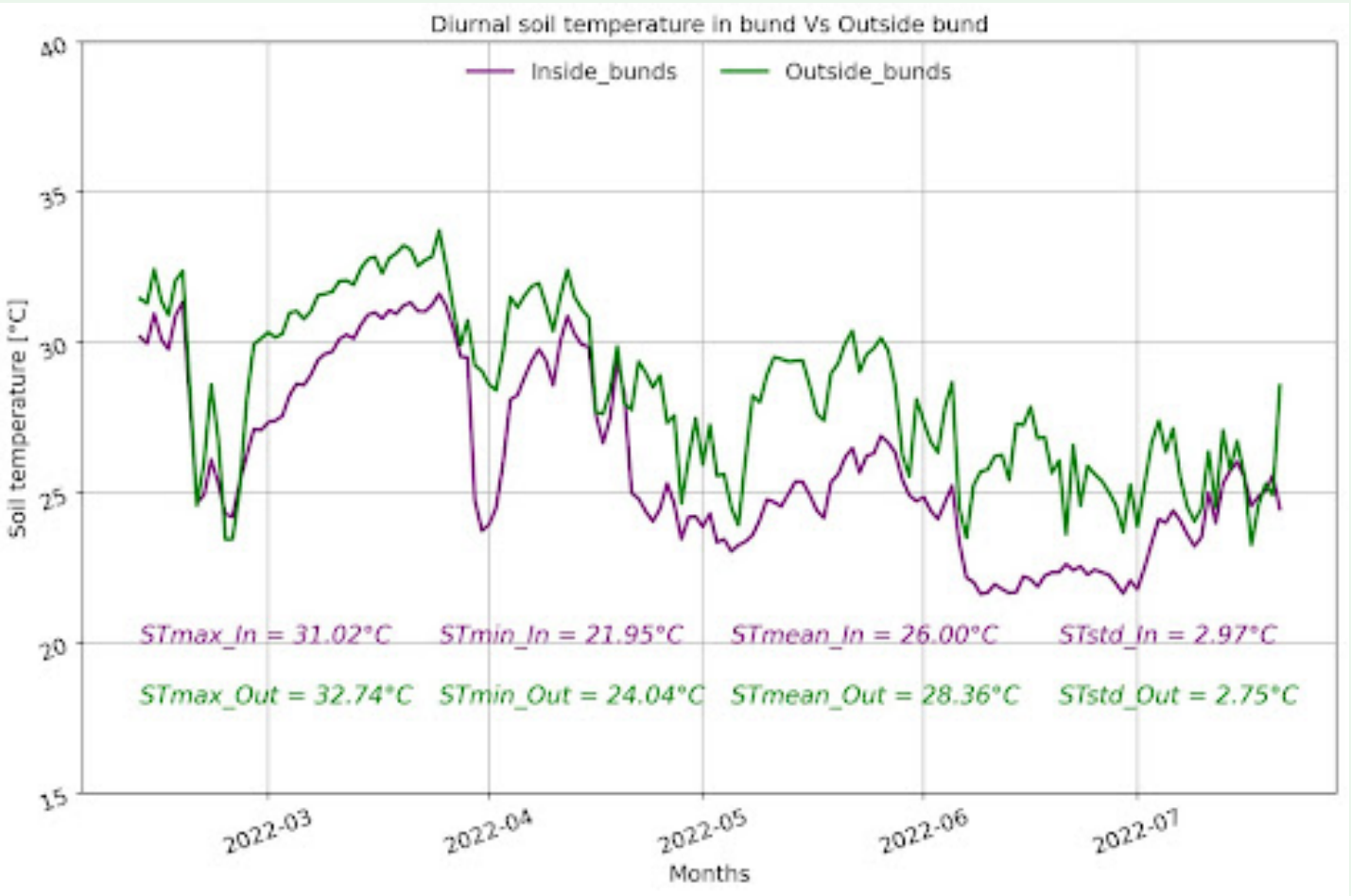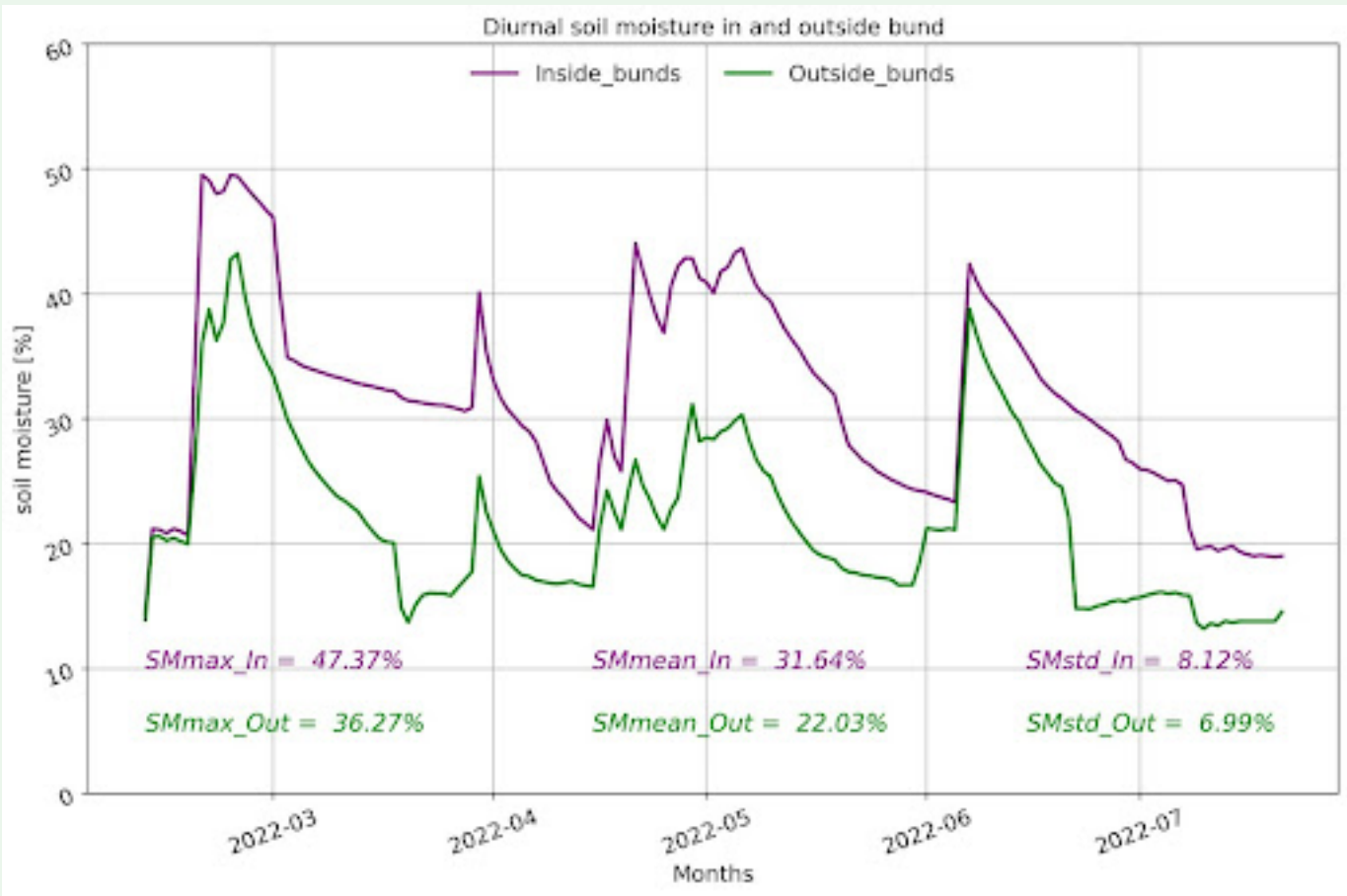

FIGURE 23: The daily variation in soil temperature was measured with TMS data loggers at Meshenani Grass Seed Bank from February 11th to 21st July 2022. The green and purple line colours represent TMS4 values outside and inside bunds.

These findings are in line with what was found by Lorenzo Villani, who examined the impact of treecovery on the micro-climate in Dodoma, Tanzania in 2018. The intervention significantly impacted the surrounding land surface temperature. When a canopy cover of 10% was reached, the land surface temperature decreased significantly by approximately 1.32 degrees Celsius.

Looking at the soil moisture content, Figure 24 illustrates the variation of soil moisture in the Meshenani grass seed bank. The soil moisture content inside water bunds was significantly higher compared to areas outside the bunds. Bunds had the highest maximum soil moisture values (47.4%), whereas this peaked at 36.3% outside the bunds. Bunds also appear to lose soil water slower, which resulted in them retaining more water for longer. This can be linked to the low soil temperature inside bunds, as shown in Figure 24.

FIGURE 24: The daily variation in soil moisture measured with TMS4 data loggers at Meshenani Grass Seed Bank from February 11th to 21st July 2022. The figure shows soil moisture fluctuations with rainfall events inside and outside bunds.

ESTIMATING WATER RETENTION

Retaining water is one of the most important and immediate effects of our interventions. Across all landscapes, huge volumes of water are retained, by slowing down and catching runoff and promoting infiltration. Yet, estimating the total volume of this retained water is challenging since all dynamics at play, such as soil conditions, evaporation, infiltration capacity and local landscape characteristics, form a complex system that eventually determines the actual water retention due to the interventions. In this section, we will elaborate on the way we estimate the total water retention volume.

To estimate the water retention volume, we use two different methods. Firstly, for our water harvesting interventions, we use the curve number (CN) method. With a set of input parameters, the model estimates the runoff that occurs after a rainfall event of a certain water depth. Depending on the landscape, we use remote sensing or weather station data, which provides detailed information on an hourly basis. The model uses a few more parameters: the slope of the land, a soil type class based on its hydrological conditions, and a classification of the current vegetation cover. The model was improved compared to last year, as it now also takes into account precipitation of the days before, which has an effect on the infiltration capacity. The model can then give us an estimation of the total water retention that can be attributed to the interventions, if we combine it with other factors such as the total area under intervention, the water retention capacity of the interventions (bunds overflow after a certain amount of rainfall), a correction factor to account for unforeseen factors such as broken bunds, and an uncertainty factor.

For treecovery, we use a different method. Here, we use the results of experiments from the field. Several years ago, an erosion and run-off experiment was done in Mpwapwa, one of the districts in the Dodoma region. The experiment concluded that without any interventions, about 24% of the precipitation would run off. Based on Manning's coefficient, we theorise that 20% of this runoff would infiltrate anyway due to the direct effect of the tree on the surroundings. This runoff reduction then only applies to the area under intensive restoration. To account for uncertainties, a final reduction factor of 30% is applied. We then use remote sensing and weather stations to obtain precipitation data for the intervention areas. All combined, these sources give us an estimation of the total water retention volume due to the implementation of treecovery.

We always try to use the most reliable methods and models available, considering the available data and resources. That's why we will further study the effect of our interventions on the water balance in 2023, starting with an elaborate water balance study in several bund sites in the Chyulu landscape. We aim to increase our understanding of our impact on the water balance and verify and improve our estimations of the retained water volume in our landscapes.
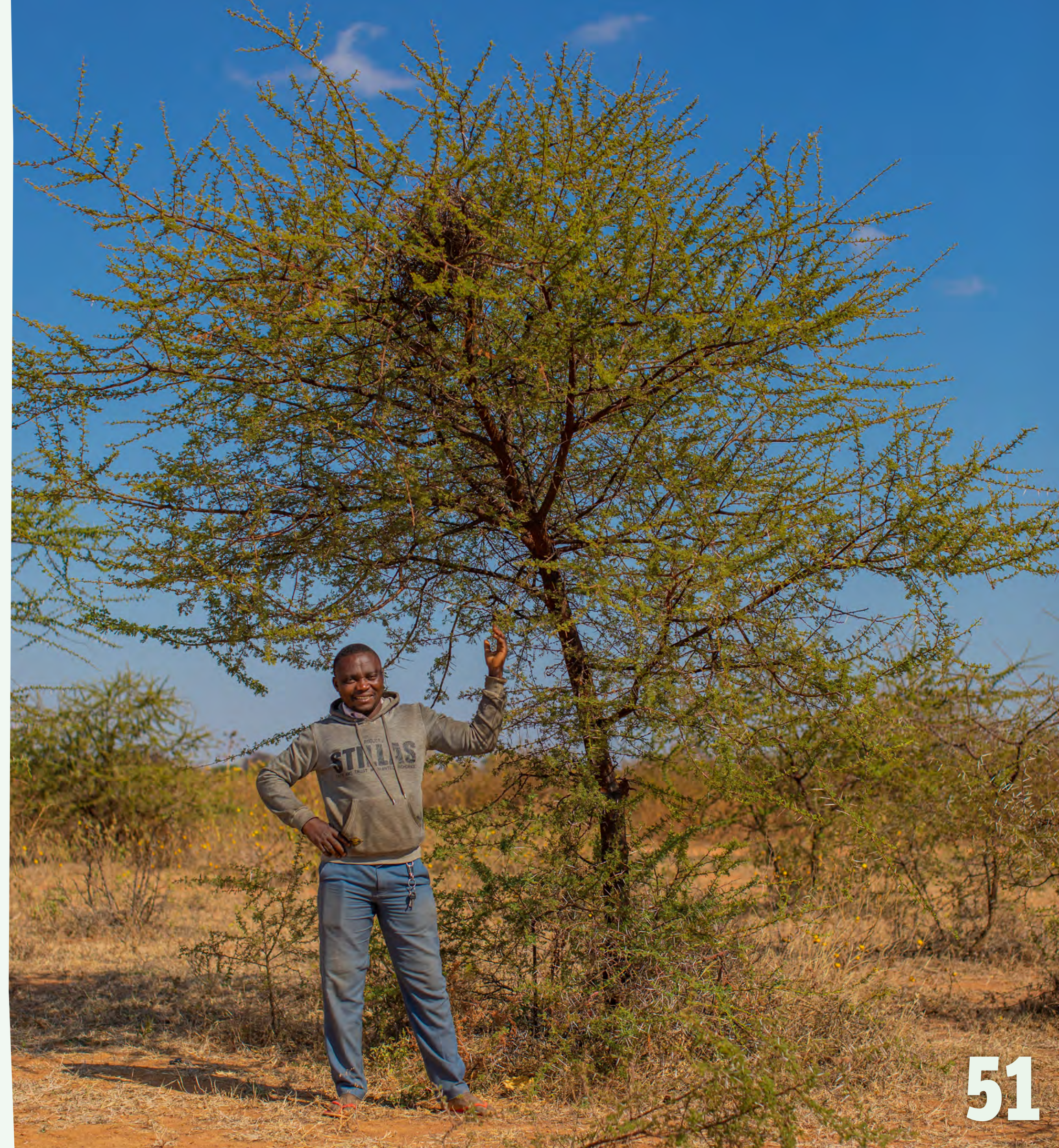
CARBON SEQUESTRATION

Sequestering carbon dioxide is a hot topic nowadays. That's no surprise: climate change is accelerated by the increasing concentration of greenhouse gases in the atmosphere. The interventions that we implement all contribute to carbon dioxide sequestration in one way or another. All interventions aim to bring back vegetation and when vegetation grows, it turns atmospheric carbon into biomass. In our agroforestry programs, large volumes of carbon are captured in the woody biomass of trees that are regenerated. In grasslands, below-ground biomass and soil organic matter are the largest carbon sinks. Carbon sequestration is a relatively slow process, though!

CAPTURING CARBON BY GROWING TREES

Our partner Face the Future created a growth model for trees that typically grow in central Tanzania, which showed that a single tree captures about 11 kilograms of carbon dioxide per year. To put this into perspective, a round trip from Amsterdam to Barcelona (the most popular holiday flight from Amsterdam) emits about 250 kilograms per passenger. However, 14 million trees combined sequester a significant volume of carbon dioxide!

Together with Face the Future, we developed a methodology to estimate the total volume of carbon dioxide that is captured by the trees in our central Tanzania program. This methodology was put into practice for the first time in October 2022. We will evaluate the methodology and refine it for further use in the coming years. The results will be used for internal evaluation and communication with partners and donors.

CAPTURING CARBON BY RESTORING RANGELANDS

As with trees, healthy rangelands contain large volumes of carbon. However, in contrast to (agro) forestry areas, most of the carbon in rangelands is stored underground, in below-ground biomass and in particular in soil organic carbon. Soil organic carbon forms from decaying organisms, such as vegetation and soil fauna. However, soil organic carbon builds up slowly. To monitor the carbon capture in our rangeland programs, we started working with our new partner Seqana. Seqana has developed a product that estimates soil carbon contents based on satellite data, which means it can easily be used for huge areas. To make sure the model outcomes reflect reality, we are currently in the process of ground truthing and calibrating the model by analysing soil samples in the lab. After this, the model can be applied to all our rangeland restoration projects to estimate the carbon build-up over time!

HIGH-RESOLUTION SATELLITE IMAGES

VEGETATION RESTORATION · Pembamoto, Tanzania

Bund digging site

May 27, 2018   May 28, 2020   May 11, 2022

Through the European Space Agency (ESA) Earthnet program we have been able to task satellites to obtain high-resolution satellite imagery of our project sites on demand. We use this satellite data for site selection, project planning and monitoring, as this series of images from the Olorika bund plot in Kenya shows.

AREA UNDER RESTORATION

The area under restoration includes the regreening of both rangeland and farmland. Based on the nature of the intervention type, we distinguish between intensive and extensive restoration. We define intensive restoration as an area being directly and physically affected by the interventions we apply. An area under more sustainable management is defined to be under extensive restoration. Following these definitions, plots where water harvesting techniques, such as water bunds and water trenches, are implemented are under intensive restoration. The direct surrounding of recovered trees, depending on the tree size, also falls under intensive restoration. On the other hand, Olopololis and the total landholding of activated treecovery farmers are under extensive restoration.

CHAPTER 4

AWARENESS IMPACT

4: AWARENESS IMPACT

If we can change the climate narrative, we can change the future of our planet. That's why communication is an inseparable part of our regreening work. We use global awareness campaigns to make people from all walks of life aware that there are solutions for the biggest challenge of our time, and that these solutions are relatively simple to implement. We want the entire world to know about the great potential of indigenous, nature-based solutions for our climate!

In 2013 we launched our first campaign with Justdiggit, focussed on the Dutch audience with well-known ambassadors and our first Patron Desmond Tutu (†). Nowadays, we're visible on multiple continents in many different countries. Thanks to a large network of amazing (media) partners and ambassadors, we're reaching millions of people worldwide and engaging and activating thousands of farmers in our project areas to start regreening their land. By using the power of technology and media, this message for the regreening of our beautiful planet is seen and felt by people everywhere – from London to Nairobi!

2022 was yet another year with several milestones from an awareness and communications point of view. We scaled our awareness campaigns to several new countries, receiving exposure in Zambia, Botswana, Lesotho, Eswatini, and Angola. In particular, we engaged the younger generations with our TikTok account, whose growth skyrocketed last year. But before we get into all of this, let's first take a moment to reflect on an important question: how did we get here?

Right from the very beginning, we've been clear about who we want to reach with our awareness campaigns: absolutely everyone! Despite this rather unusual and challenging 'target' audience, our media partners share our vision that everyone can (and should!) be an ambassador for regreening. Even when we just started out as a tiny start-up with one 'office' in Amsterdam, we were quickly reaching the entire Dutch market because of the support of our partners.

The first Justdiggit campaign was launched in the Netherlands in 2013. After years of steady growth where we became widely visible in this country through radio, television and out-of-home exposure, we expanded our campaigns to other parts of the world. In 2018 we launched a campaign in Tanzania, in 2019 in Kenya and Germany, and in 2020 we reached the other side of the North Sea by launching a major awareness campaign in the UK. In Africa, we're currently active with out-of-home exposure, billboards and digital screens in 13 countries. In total we are visible with our awareness campaigns in 21 countries throughout Africa and Europe.

As shown in figure 25, our growth in income by donations has increased a lot over the past few years! As we generally don't actively ask for donations, many organisations, companies and individuals dig in with us because of our successful awareness campaigns and other communication outlets.
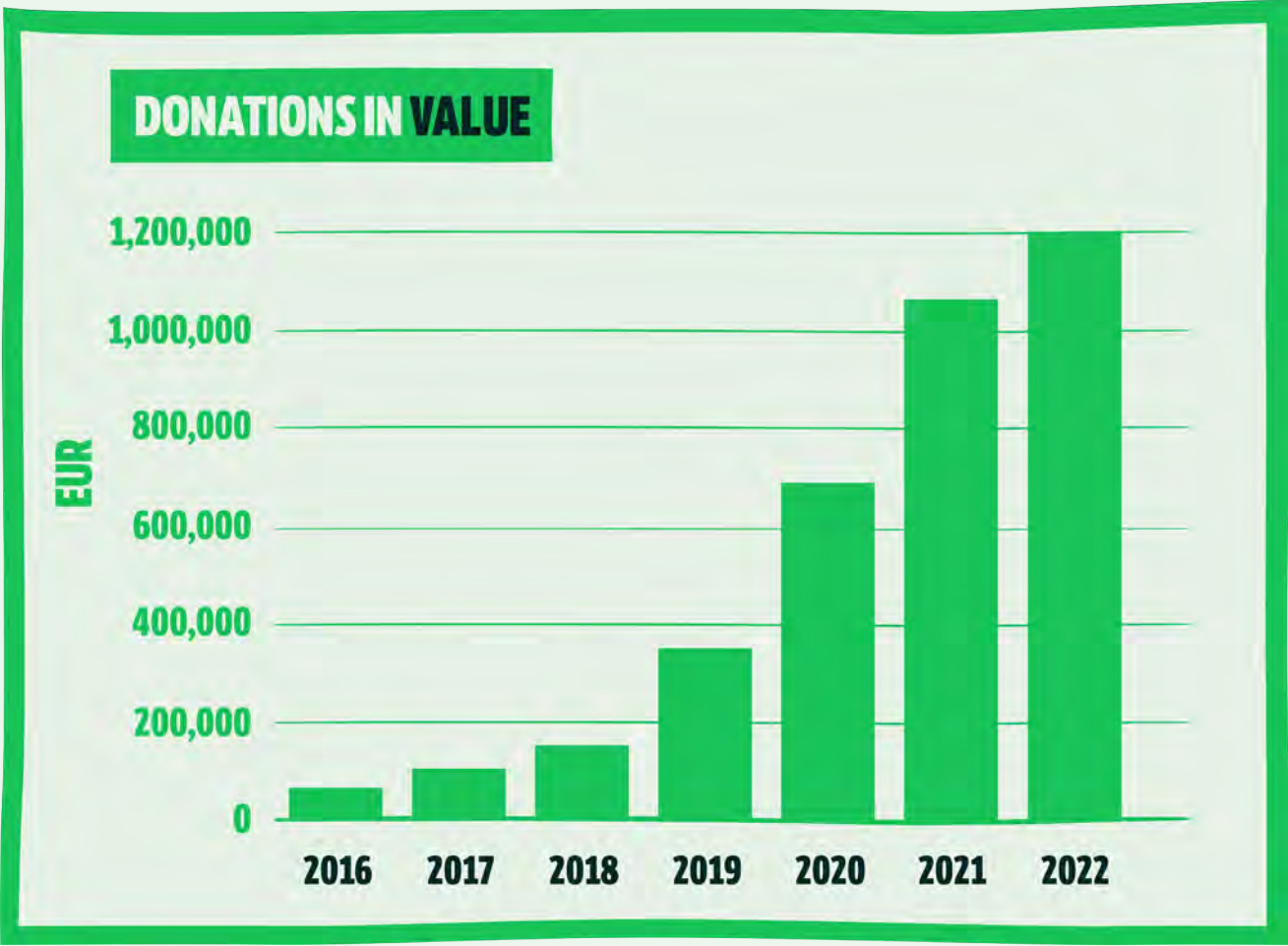

FIGURE 25: Growth of 19% relative to 2021, in consumer donations.

AWARENESS IMPACT 2022

GLOBAL & THE NETHERLANDS

Our global online and offline awareness campaigns are developed to promote nature-based solutions and to inspire, unite and activate an entire generation, and grow a landscape restoration movement.

SOCIAL MEDIA: SUCCESSFUL LAUNCH OF OUR TIKTOK ACCOUNT

Our social media channels have performed very well, in general, this year, with significant growth across all platforms. However, our newest addition, TikTok, has taken the lead since its launch in February 2022. The channel received remarkable growth, gaining over 140 thousand followers in just a few months. Our content has also been well-received, with our most popular video reaching over 4 million views!
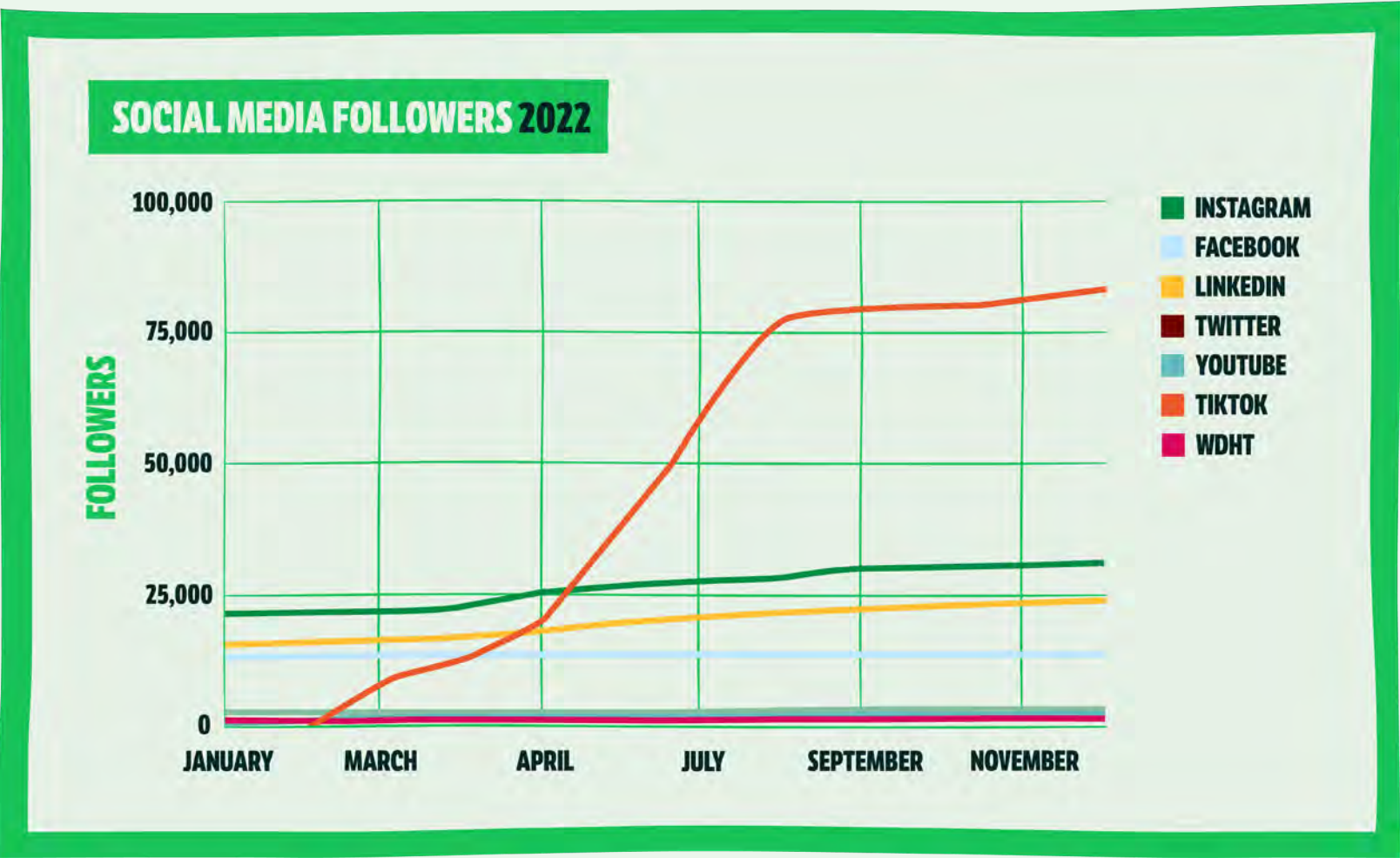

FIGURE 26: Growth in TikTok followers since the launch in February 2022.

TikTok has been a game-changer. It allows us to reach new audiences and engage with a younger demographic in a more interactive and fun way. Their genuine interest and questions show us how much willingness there is among Gen Z to take real climate action. We're convinced TikTok can be an important tool to grow an interconnected global regreening movement, so we're looking forward to continuing to connect with our community and share our message through this platform in the years to come.

EUROPEAN OUT-OF-HOME CAMPAIGNS WITH JCDECAUX

Thanks to the amazing support of our media partners, our campaigns were visible in multiple European countries last year. Our green message was seen, heard and felt in a variety of ways: from billboards and digital screens to radio and television, and from social media to cinemas. And this effort hasn't been in vain! We've reached millions of people in 2022. The gross media value of this exposure amounts to approximately 10 million euros.

4: AWARENESS IMPACT

AFRICA

AWARENESS CAMPAIGNS

2022 was an exciting year when it comes to our visibility on the African continent. Thanks to a close collaboration with JCdecaux, Havas Africa and our ground team, we were visible on both static and digital screens in 13 African countries in over 131 locations. The central message in the campaigns was always clear: the essential role of community members (especially farmers and pastoralists) to return nature and improve the productivity of their land!

Last year, we saw the importance of the announcement of Ben Pol as Justdiggit brand ambassador for our awareness in Africa. After this announcement, we've partnered up with four more renowned artists in Tanzania. In June, together with The LEAD Foundation we held a press conference in Dar es Salaam, Tanzania, to announce the ambassadorship of Christina Shusho, Joh Makini, Frida Amani and Jaymondy. The press release was documented by 9 national tv stations, 5 radio stations and covered by many social media influencers.

All artists operate in different music genres and attract a broad audience. This has allowed us to increase our reach and appeal to many Tanzanians – especially among the younger generations! We're grateful that these artists decided to raise their voices for a greener, cooler planet and that they've become an important part of this growing land restoration movement.

GRASSROOTS COMMUNICATION

Grassroots communication plays an essential role in bringing about the change our planet needs. We use it to make people in local communities aware that there are solutions for the large-scale land degradation – and that these solutions are practical and easy-to-apply. To reach as many people as possible, we use communication tools such as movie roadshows, radio programs, murals and SMS services. In 2022, we created a new documentary (Kisiki Hai 3) that provides enhanced technical knowledge for smallholder farmers that are already trained in the programs. The documentary was shown in 75 villages. Additionally, we have painted 43 mural locations and provided an SMS service to 47,000 recipients in the course of the year.

SO, THERE YOU HAVE IT – A COMPREHENSIVE LOOK AT THE IMPACT WE MADE WITH OUR PROGRAMMES LAST YEAR! IF YOU'RE STILL UP FOR SOME MORE POSITIVE REGREENING NEWS AND WANT TO CONSULT OUR MOST IMPORTANT IMPACT FIGURES IN ONE SINGLE OVERVIEW, WE RECOMMEND CHECKING OUT OUR **IMPACT SUMMARY.** AND IF YOU WANT TO KNOW MORE ABOUT HOW WE'RE PLANNING TO TRULY SCALE UP OUR REGREENING EFFORTS IN THE COMING YEARS, MAKE SURE TO VISIT THE **DIGITAL REGREENING PLATFORM** SECTION ON OUR WEBSITE!