



# ANNUAL REPORT 2022

We  
Robotics  
THE POWER OF LOCAL

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ENGAGEMENT

TOPICS

NAD\*

FREQUENCY OF ENGAGEMENT

NAD LEADS (WELL-FL)

USE CASE-RELATED Q&A  
SPEC. TIME

SPECIAL PROJECT TRAINING  
TECHNOLOGY-RELATED QUESTIONS (e.g. how good)

FL <> NETWORK

QUESTIONS BY VITE OR TOPIC

FL  
ER

NER <> FL

Answer

USE TO TRAINING  
ER

CHILDREN AND WOMEN AND HOW TO SUPPORT THEM

JOINT PROJECTS/ PARTNERSHIP

FL <> FL

WORK REPAIRS + TECHNOLOGY

NETWORK / FL <> FL



# FOREWORD

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It has been seven years since WeRobotics' and the Flying Labs Network's story started. The year 2022 stands out as a key milestone for us, a year that closes one chapter and allows an exciting new one to emerge. The story of 2022 starts with sharing and celebrating the success of our Inclusive Networks model, through the publication of our localization report, summarizing five years of our practical approach, our key learnings and, yes, our failures too along the way. It is also the year that sees our Inclusive Networks model adapted by others besides WeRobotics for the first time. These are two very exciting strategic highlights for our still young organization.

The Flying Labs Network meanwhile continued its impressive growth in size, strength, skills, and impact. Two years after introducing our Network Governance model and after the 4th round of evaluations, we can see striking growth trends leading towards significant future opportunities. Flying Labs keep on making history in drone innovations for positive social impact. For example: Flying Labs have transported over 1,000kg of medical payload more than 70,000 kilometers, delivering over 50,000 vaccine doses against Covid-19, tetanus, polio and other diseases. Several Labs have become many of their countries' first local experts to receive beyond visual line of sight permissions for drone deliveries. Others have turned drones into multi-sensors for smart cities. Flying Labs in multiple countries have begun flying the first-ever swarms of drones for data collection over urban areas. Elsewhere, Flying Labs have been using drones to mitigate conflict between farmers & herders in rural and more remote locations. All of this has happened while engaging across the world with over 7,000 youth and community members, on a grassroots level, to redefine what it means to be a drone and data expert.

While we will always be fascinated by technology and data, and the many ways they can be powerful tools to support social impact on a local level, we always stay true to our vision and mission of the Power of Local. Our collective work is about so much more than just the robots; together we're building a new way to use technology for sustained bottom-up social change. Our in-person Flying Labs retreat in October 2022 in Kenya was the perfect example of this principle, where everyone on hand could see up-close for themselves the secret recipe of our shared work: equal parts people, passion, creativity, culture and diversity.

We are keen to share the details of our 2022 story with you in this Annual Report. If any of our ideas, initiatives, achievements and learnings inspire you to collaborate with us in 2023, please reach out to the humans behind WeRobotics at [humans@werobotics.org](mailto:humans@werobotics.org).

*Co-Founders and Board of Directors*

WeRobotics transferred **56% of its revenue directly to locally owned organizations in 2022**, including local non-profits, social enterprises, startups and universities.

OUR TEAM



**5**  
Continents

**17**  
Countries

**57%**  
Women

[LEARN MORE HERE](#)

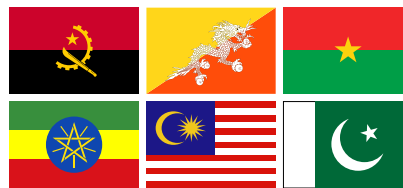
FLYING LABS:



**37** Flying Labs

**272** Leaders & Experts

New Flying Labs:



LOCAL SOLUTIONS:



**54** Projects Initiated

**52** Trainings Organized

ECOSYSTEM:

**158** Local & Global Ecosystem Activities & Events Organized (WeR & FL)

STORYTELLING:



**86** Blog Posts Published



**17** Webinars Organized

**52** Conferences Attended

**317** Local & Global Partners



EMPOWERMENT OF LOCAL COMMUNITIES BY FLYING LABS:

**7,024** Youth and community members engaged

**582** Professionals trained



CAPACITY STRENGTHENING:

**175** WeShare Resources/ Tools Created and Shared since 2019

**24** Project & Training Use Cases Created & Published

**71** Internal Learning/Sharing Sessions Organized which include:



**33** working group discussions

**20** sessions of live online learning program

**12** WeSupport sessions

**6** in-person trainings

ENABLING COLLABORATION WITHIN THE FLYING LABS NETWORK:

**12** Regional calls

**6** Co-creation sessions organized

**42%** of FL organized joint trainings and events



TRANSFER OF OPPORTUNITIES TO FLYING LABS:

**83** Project, training and other opportunities transferred to Flying Labs

# Strategic & Organizational Achievements

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## STRATEGIC ACHIEVEMENTS

With seven years into our operations and since introducing our framework for the Flying Labs Network five years ago, 2022 represents the most important year of consolidation for our organization. This consolidation, both on the strategic as well as organizational level, allows us to close the 3rd chapter of our [organizational history](#) and lay the needed base for chapter 4 to come in 2023.

### » Localization Report

HIGHLIGHT



In March 2022, we published the most detailed report to date on the localization success of Flying Labs and WeRobotics. The report titled “The Majority of Localization Efforts Have Failed. This One Continues to Shine” is based on more than 5 years of first-hand, operational experience, learnings, evidence, data and impact with local organizations in 30+ countries. It was co-authored by 12 colleagues from Flying Labs and WeRobotics and independently peer-reviewed. Discover the report [here](#).

### » Inclusive Networks Model

We partnered with the Senegalese Think-Tank IPAR and are part of a consortium including IPAR, Sunbird, AI and CSEA for an initiative called GRAIN for the first adoption of our Inclusive Networks model. The aim of GRAIN is to create the first Gender and Responsible AI Network in Sub-Saharan Africa. WeRobotics’ role is to support GRAIN in adopting and adapting the Inclusive Network model and supporting the development of their network framework throughout 2022 and 2023. In 2022, WeRobotics led a one-week strategy workshop for the consortium and supported the GRAIN team in creating their network framework for GRAIN. The GRAIN network is scheduled to be launched by mid-2023. Read more on GRAIN [here](#).

## » Power Footprint

We publicly introduced the idea of the Power Footprint initiative at the virtual Skoll World Forum in April 2022, with a discussion on the key factors to be considered when co-creating practical metrics to measure our power footprints. Based on feedback from this session and a number of follow-up discussions, we created a first proposal for a Proof of Concept (POC) and shared it widely within the international non-profit and donor community for feedback and engagement. In parallel, we engaged Global South organizations through a series of discussions that led to creating a dedicated webpage for this initiative. We plan to initiate the proof of concept in 2023. Our key motivation for this initiative is to create a practical, open, transparent and independent evidence base for localization initiatives that enable real shifts in power, providing a common platform and brand for like-minded organizations and coalitions that genuinely seek to reduce their footprints. Learn more about the Power Footprint on the dedicated website [here](#).

## » Inclusive Leadership Strategy

2022 was a pivotal year for our Inclusive Leadership strategy that focuses on taking our proximate leadership model one step further by transitioning organizational leadership. Throughout the first 3 quarters of the year, we worked closely with the Flying Council. In 8 Council working sessions we drafted our initial proposal for the transition. We then presented this draft to all Flying Labs members at the in-person Flying Labs retreat in October 2022, followed by a joint co-creation session to gather additional ideas and feedback for the final proposal. In late 2022, all feedback and ideas gathered were integrated into the final strategy that will be finalized together with the Flying Council in early 2023. Our goal is to start implementing the first legal and executive leadership steps in 2023.

In summer 2022, we have also established a formal partnership with Stopping as Success (SAS), a dedicated program led by experts who are very well versed in responsible transitions from international nongovernmental organizations to locally-led organizations. The SAS program has an “accompaniment” track that enables partners like WeRobotics to directly benefit from ongoing guidance and direct feedback. The personal and dedicated guidance from the SAS team has been of tremendous support throughout 2022.





## ORGANIZATIONAL ACHIEVEMENTS

### » Ashoka Fellowship

Our Co-Founder Sonja Betschart was awarded the [Ashoka Fellowship](#) in early 2022, joining the most prominent network of social entrepreneurs who champion innovative new ideas that transform society's systems and improve millions of lives globally. As a social impact organization that is co-creating and facilitating a network, we are best placed to know and appreciate the many values that can be unlocked by being part of a network of like-minded organizations and individuals. The WeRobotics team has already accessed a wealth of opportunities and engaged in new collaborations in this first fellowship year. These include participating in a Europe-wide collective working on [Changing the Gender Narrative](#), various Ashoka events in Switzerland, Germany and Brussels, sharing experiences with Ashoka fellows worldwide and participating in highly valuable professional development programs that Ashoka offers its fellows and their organizations.

### » Aligning our Organizational Structure with our Strategy

We undertook an important organizational change to align our organizational structure with our “Inclusive Leadership” strategy. This to prepare our organization for the strategy implementation planned as of 2023. This change meant to fully walk the talk when it comes to local expertise, including for our organizational setup. Since 2017, a growing part of our organization was the internal engineering team fully based in Switzerland, a team that grew extensively by the end of 2021. Over the years, the Swiss-based engineering team has advanced innovations in drone applications, such as low-cost solutions for medical cargo deliveries, mosquito-vector control and more. The Board of Directors and Executive Leadership unanimously decided on closing the engineering department in 2022. With all ongoing projects, some of them multi-year projects, coming to an end by June, the department was closed at the end of June 2022 and follow-up opportunities were transferred to Flying Labs. This important decision was a first important step in aligning with our Inclusive Leadership strategy and allowed us to acquire our own lived experience of the many facets of shifting power. It also allowed us to learn first-hand that walking the talk asks organizations and their teams for courage and resilience.

### » Holacracy at WeRobotics

After introducing our Holacracy-inspired organizational setup in 2021, we continued testing out the approach throughout 2022. The key take-away of the many learnings made in 2022 was that this approach represents a journey and thus continuous improvements and reviews are of essence. A complete review of the various circles and roles at the end of 2022 will lead us to further improvements of the setup in early 2023.

## » Audits

### Financial Audit

We continued our collaboration with the auditors of Haskell & White for the audit of our 2022 Fiscal Year finances. The yearly financial audit continues to be a learning experience and allows us to keep on improving our policies, processes and governance. Find our audited financials on our website under [werobotics.org/organization](https://werobotics.org/organization)

### Cybersecurity Audit

Building on our first cybersecurity audit of 2020/2021, we engaged in our second comprehensive cybersecurity risk assessment performed by an independent team of Certified Fraud Examiners and Certified Information Systems Auditors in Q4 of 2022. The team began their examination in November of 2022 with a first evaluation of our safeguard procedures, privacy, resiliency and reputation risk. The audit will be finalized by the end of Q1 2023 and we expect to keep our high mark of A-. More important than the actual grade, the audit will help us to keep on improving our IT practices by remaining alert to potential threats, training our employees to use best practices and monitoring our systems.

# Flying Labs Network

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## » Flying Labs Retreat

HIGHLIGHT



Our biggest highlight was with no doubt the in-person Flying Labs Network Retreat in October in Nairobi, Kenya. This was the first in-person since 2019. The retreat's goal: bringing together Flying Labs Coordinators and the WeRobotics team to jointly ideate, discuss and decide on shaping the next chapter of the Flying Labs Network. With a growing network sprawling over 37 countries by the end of 2022, bringing people together, in person and in one location, was a significant achievement. Forty participants braved travel from 31 countries to reach Kenya. For some Flying Labs, this meant finding creative ways to make their way around hurricane Ian or spending 100 hours traveling back and forth from the retreat. In two days packed with co-creation sessions, we jointly tackled the Network's opportunities, collaboration and sharing challenges, as well as ideas for the Network's future. In addition to taking an important number of decisions together, we also got to enjoy quality social time together, indulged in local culture and learned from each other in learning sessions organized by Flying Labs. Much of our operational work in 2023 will focus on implementing these decisions and thus continue to strengthen the growth of the Flying Labs Network.

The retreat video gives you a glance at the uniqueness of the Flying Labs Network and its secret recipe: people, passion & diversity. Read the blog post [here](#).

## » “Ripples of Social Change” Learning Project

Social Good projects are typically designed and implemented to generate change around a specific problem or set of problems, often within shorter time scales. As a result, their impact tends to be more immediate and, thus, relatively straightforward to measure. However, the longer-term impact of many systems change efforts is necessarily more socially diffuse over space and time, which makes measuring this impact far more challenging. And yet, understanding this longer-term impact—what we call the ripples of social change—is just as important as assessing the impact of social good efforts over much shorter time horizons. We launched a joint learning project called the “[Ripples of Social Change](#)” with Save the Children and 8 Flying Labs in Asia, Africa and Latin America. The learning project aimed to develop an alternative approach to detecting evidence of systems changes vis-a-vis indirect impacts. Together with all participating Flying Labs, we published a detailed report about the third-order impacts of Flying Labs projects, with recommendations to build on such an informative project in future. Through this pilot research project with Flying Labs, we identified patterns of systemic change due to activities led by Flying Labs. We further shared insights from this project with stakeholders from various organizations in a learning session by Save the Children Sweden.



*“This activity helped us realize our actions and their consequences or the ripples it creates in our system, which influences other related parts beyond our planning or estimation. The experience has shown us that local problems are very complex, and one action is not enough to tackle all these complexities. In essence, every problem is affected by so many factors that it can't be solved with a single solution. On the contrary, if one solution does solve the problem, it's not just one problem that it's solving but a range of problems because of the causal ecosystem.”* Nepal Flying Labs

## » Capacity and Skill Strengthening

### WeShare

Since its launch in 2020, we have continuously and extensively developed “WeShare”, the internal Knowledge Sharing Platform for Flying Labs. WeShare grew from 50 to just under 100 dedicated resources in 2022, including a range of thematic guidelines and technical workflows, software guides, project and training portfolios as well as resources on communication, fundraising, stakeholder engagement and business development for Flying Labs. The platform keeps growing with regular content, news and opportunities for Flying Labs and is updated on a regular basis, including with resources created and shared by Flying Labs.

### WeSupport Sessions

WeSupport sessions are internal interactive virtual learning sessions with foremost a technical focus to support the work of Flying Labs. In 2022, we co-organized a total of 12 sessions. Technical topics covered various GIS and data analysis deep-dives. To broaden the scope of these sessions and support Flying Labs in their sustainability and communication efforts, 2022 sessions also introduced new topics such as tools and skills for video editing, collaboration with international clients, using our online mission and budget estimator and how to create a theory of change and develop impact indicators.



### Microgrants

Microgrants are an integral part of our capacity strengthening initiatives with Flying Labs. In 2022, microgrants supported 9 Flying Labs with financial or free hardware support that allowed them to implement small learning projects and proof of concepts. In addition to the financial support, microgrants also offer Flying Labs extensive dedicated technical support from WeRobotics' Drone & Data team as well as storytelling support, bringing value that in many ways can be even more important than financial contributions. The 2022 microgrants were part of two specific series:

- **Skydio Microgrants:** Thanks to our strong partnership with Skydio, a leading manufacturer of autonomous drones that make the world more productive, creative and safe, the three following Flying Labs received each a donated Skydio 2+ Pro Kits, in-kind training as well as donated Skydio 3D Scan software to pursue a social good project of their choice:
  - Nepal Flying Labs: Drones for heritage conservation using 3D modelling of heritage sites in Changunarayan Municipality. [Use case](#) and [Skydio article](#).
  - Namibia Flying Labs: Assessment of public hospital elevated towers
  - Kenya Flying Labs: Wildlife Counting in Kenya. [Skydio article](#).
- **"Turning Data Into Action" Microgrants:** Throughout the year, we awarded 6 microgrants under the "Turning Data into Action" program, an internal program that focuses on utilizing the full potential of drone data and equips Flying Labs with tools and methods to take project stakeholders and participants along the data journey. The microgrants have been awarded to following Flying Labs to implement proof of concepts and learning projects of their choice:
  - Benin: Realization of a transit corridor in the settlement of conflicts between stock breeders and farmers. [Blog post](#)
  - Malawi: Lilongwe town planning using machine learning models and drone maps. [Blog post](#)
  - Pakistan: Assessment of mangrove forests along the coast of Pakistan. [Blog post](#)
  - Senegal: Cartography of Medina Baye for a redevelopment of the site (project still ongoing).
  - South Africa: The use of drones in disaster preparedness, mitigation and response. [Story Map](#)
  - Uganda: Drones for risk mitigation for coffee farmers to support decision making for financiers. [Use Case](#)

### Sustainability Program for Flying Labs

Based on strong and urgent demand from the Network, we launched our first dedicated “Sustainability Program” for Flying Labs. We tested a new format of internal live online courses that gives a limited number of Flying Labs the opportunity to follow an intensive, practical and hands-on learning course over a limited period, supported by topic experts. Over 10 weeks, 2-4 team members of 6 Flying Labs participated in weekly 2-hour online learning sessions, followed by homework for them and their teams. The course covered topics such as value proposition, business model, M&E/impact definition, partnerships, ideal team setup and income generation strategies/fundraising. We plan to set up a dedicated working group to continue supporting the 6 Flying Labs in their implementation of the course outcomes in 2023 and repeat the course in 2023.

### Engaging with Local Civil Aviation Authorities

An important number of Flying Labs are planning to, or are already closely collaborating with Civil Aviation Authorities (CAAs) in their countries, this for topics such as improvements of existing regulations and policies, implementations of training syllabi and or certification standards for drone pilots and more.

Flying Labs have thus requested dedicated expertise and support from WeRobotics for their engagements with CAAs. To answer this demand, our first step in 2022 was to scope the various needs within the network and complement our team with a new expert to create a dedicated program for CAA Engagement in 2023 that will include:

- A Safety Culture course, based on the same model as the Sustainability live online course mentioned earlier in this report
- A learning project between a Flying Labs, their local CAA, WeRobotics and Deloitte Consulting to jointly explore the model of a CAA engagement framework for Flying Labs

### Turning Data into Action Online Course

Adding to the range of courses offered on WeRobotics’ [Online Training Academy](#) and also available free of charge to Flying Labs, we launched the internal “Turning Data into Action” online course for Flying Labs. This internal program course focuses on utilizing the full potential of drone data and equips Flying Labs with tools and methods to take project stakeholders and participants along the data journey.

## » Working Groups

Building on the learnings of 2021 and in response to the needs of Flying Labs Network to strengthen their skills and expertise on specific topics, we launched two new working groups in 2022: Data Ethics & Translation Working Groups. As part of a mutual learning, these working groups aim to create and improve tools and resources that will strengthen Flying Labs’ collaboration on a global scale. They also provide a space where Flying Labs members exchange ideas on topics of interest, develop expertise and explore future project opportunities relevant to our shared organizational vision and mission.

# Knowledge Sharing & Storytelling

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## » Collaboration & Sharing within the Network

Throughout the year, WeRobotics together with Flying Labs organized a wide variety of webinars with the goal of sharing experiences on key topics that are relevant to Flying Labs and allow Flying Labs members to deepen their knowledge and expertise. To broaden collaboration and sharing, we introduced coffee chat sessions that provide Flying Labs with an informal space to exchange ideas on topics of interest, brainstorm on new collaboration ideas and strengthen members' relationship with each other in the global Network.

## » International Women's Day 2022

HIGHLIGHT



International Women's Day, held every year on March 8, is an opportunity for us to take a moment to reflect on the advancement of women's empowerment globally and participate in events that celebrate women's work worldwide, especially in the drone and STEM fields.

For IWD 2022 and together with Flying Labs members from 8 countries we created a video to raise awareness on the need to #breakthebias and give more women opportunities, visibility and resources to succeed and pursue careers in technical fields like their male counterparts. We also held a virtual event with leading ladies in the Flying Labs Network to inspire more women to pursue careers in STEM or any field of choice. [Blog post](#)

## » Conferences & Keynotes

Sharing experiences and learning is an integral part of our work. We do so through our reports, blog posts and also through actively investing our time in conference attendance and keynotes. Throughout the year, WeRobotics as well as Flying Labs organized sessions and actively participated in a wide variety of conferences and forums. Following are the most notable participations of WeRobotics and Flying Labs team members' public sharing activities:

- » 2022 Skoll World Forum (virtual format): WeRobotics organized an ecosystem event in partnership with the Overseas Development Institute (ODI), Ashoka and Save the Children Sweden to introduce the Power Footprint initiative. [Blog Post](#)
- » AI for Good: WeRobotics and Philippines Flying Labs hosted a session in the "Robotics for Good" programming track on AI-powered vehicles for humanitarian help deployment. [Blog Post](#)
- » European Entrepreneur Forum (EEF): WeRobotics participated in the first edition of this forum that brought together a select group of leading European entrepreneurs, including social entrepreneurs, to engage discussion on how entrepreneurs can contribute to social impact.
- » AI for Good webinar on Disaster Risk Reduction: Japan Flying Labs participated as one of the webinar speakers to share their extensive experience on using drones for DRR.
- » Drone Summit Colombia: Panama Flying Labs and WeRobotics held a virtual joint keynote on the contribution of drones to SDGs.
- » Airworks: WeRobotics was given a prime spot in the conference lineup to speak about the medical cargo drone delivery work with Flying Labs across the world.
- » Digital Peacebuilding: WeRobotics gave a keynote at the Alliance for Peacebuilding about Flying Labs, our joint localization model, and the Power Footprint.
- » Ashoka events:
  - WeRobotics was invited to participate in the Ashoka Fest in Germany as one of the new fellows to the network.
  - Welcome Change series: WeRobotics was featured and shared experiences and learnings in a webinar titled "Drones for Good with women at the helm".
  - WeRobotics co-led a session on gender equity and "Changing the Gender Narrative" at the Ashoka Changemaker Summit 2022.
- » Calestous Juma Seminar Series: WeRobotics held a session in the 3rd edition of this seminar on "Women in Artificial Intelligence".
- » Showcase 2030: WeRobotics was part of a panel discussion on social entrepreneurship together with Ashoka.

In addition to these conference participations, 2 Flying Labs organized their own conferences:

- » South Africa Flying Labs successfully organized their first Disaster Management Conference. The 2-day conference was held in Cape Town and also allowed for remote/virtual participation. Nepal and Sierra Leone Flying Labs as well as 2 WeRobotics team members contributed to 3 sessions virtually. Esri, one of WeRobotics strategic technology partners, was a main sponsor of the conference.
- » Zimbabwe Flying Labs organized their first International Drone Conference successfully. WeRobotics participated virtually in one session, and Flying Labs of neighboring countries attended in person.

Throughout the year, following Flying Labs organized and led publicly available webinars and events on a variety of topics:

- Zimbabwe and Côte d'Ivoire co-organized a webinar titled "Crop Spraying, Opportunities and Benefits." [Blog Post](#)
- Haiti Flying Labs organized Drone Flight Day.
- Bhutan Flying Labs organized Drone for Forestry event.
- Zambia FL hosted a webinar on building low-cost cargo drones. [Blog Post](#)
- Sierra Leone FL hosted a disaster management webinar with speakers from Nepal and South Africa Flying Labs. [Blog Post](#)
- ICAP RPAS Symposium: Côte d'Ivoire Flying Labs represented the Flying Labs Network and WeRobotics at the yearly symposium.
- Build Peace Conference 2022: Bolivia, Spain, Uganda and Cameroon Flying Labs attended the conference in person in Germany and jointly organized STEM training sessions for children and adults. [Use Case](#)
- Uganda Flying Labs also presented a research paper at the Build Peace Conference on the topic "Harnessing Flying Robots to Transform Formally War-torn Keto Corridor in Uganda."
- Cargo Drone Virtual Summit in Africa: Madagascar Flying Labs participated in this summit as a speaker to share their experiences on implementing impactful cargo drone projects.
- Nigeria Flying Labs hosted a webinar titled "Precision Analytics in Agriculture for Smart Farming".



# Sector Programs

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Through our sector programs, we strengthen capacity, facilitate knowledge exchange between Flying Labs and create impactful partnerships with technology and organizational partners. These programs also serve to expand locally-led practice across multiple sectors. From climate action to education to health and humanitarian aid, our sector programs provide solutions that drastically improve the quality of life for many people in different countries.

For this report, we have selected project highlights. You can find an important number of additional projects and activities in the [Flying Labs Blog](#) and the Flying Labs [Use Case Library](#).

## » AidRobotics Highlights

*The AidRobotics sector program focuses on drones and timely data to make informed decisions for humanitarian, disaster risk reduction, response and recovery operations. Learn more about AidRobotics [here](#).*

### Engaging Stakeholders in Disaster Preparedness

WeRobotics and Disaster Preparedness and Prevention Initiative (DPPI) continued to work together to carry out a comprehensive and detailed review of the capacity, experience, opportunities, and challenges that the DPPI Member States face in their use of drones in disaster management, see this [blog post](#). The analysis and results from this project formed the basis for a follow-up of dedicated workshops organized by WeRobotics to present its key findings and recommendations to all stakeholders. These workshops yielded additional insights that we integrated into the final report submitted to DPPI in October 2022.

### South Africa Flying Labs Leads Disaster Preparedness in Urban Informal Settlement

South Africa Flying Labs worked with the city of Johannesburg and the local community of the Stjwetla Informal Settlement to introduce a proof of concept for disaster preparedness and response using drones and data. The base maps as well as flood and fire risk maps created from the high-resolution drone data allowed to initiate data-driven discussions between a wide variety of local stakeholders. These discussions led to creating mitigation plans for potential disaster scenarios and sharing recommendations for access routes for fire and emergency response teams. Seeing the high interest from the large variety of stakeholders, South Africa Flying Labs decided to organize and host the first ever Disaster Management Conference in South Africa in October 2022.



## » HealthRobotics Highlights

The HealthRobotics sector program focuses on field testing and implementing cargo drone, vector-control and data solutions to improve public health services in remote areas. Learn more about HealthRobotics [here](#).

### Madagascar Flying Labs Leverage Cargo Drones for Medical Deliveries

Madagascar Flying Labs in partnership with Population Services International and WeRobotics facilitated the deployment of 674 cargo drone flights serving 30 remote medical resupply points and 40 public health facilities across 4 districts in Madagascar, while developing a digital supply chain platform to respond to real-time needs of health facilities. Medical delivery drones transported a total of 1,095 kilos of payload over 72,600 kilometers, delivering over 50,000 vaccine doses against Covid-19, tetanus, polio and other diseases. This project served communities in remote areas and was supported by Twilio.



WATCH VIDEO

### Philippines Flying Labs Leads Medical Drone Delivery in Tawi Tawi:

To enable locally-led projects and ownership through drones for medical delivery, we provided in-person training to the team of Philippines Flying Labs to develop its expertise and lead medical drone delivery projects across the country. This effort made Philippines Flying Labs the country's first organization to carry out medical drone delivery including the first ever use of drones to deliver the Pfizer COVID vaccine.

The Civil Aviation Authority of the Philippines (CAAP) granted Philippines Flying Labs the [country's first beyond visual line of sight permissions](#) for drone deliveries. Together with local health partners, Philippines Flying Labs delivered a wide range of essential medicines for distances between 40 kilometers and 55 kilometers in Agusan. Deliveries included Pfizer Cominarty Purple COVID-19 vaccines; Pfizer Cominarty Orange COVID-19 vaccines, Janssen COVID-19 vaccines, Celecoxib, Clopidogrel, Amoxicillin, Metoprolol, Ciprofloxacin, Dicycloverine, Carvedilol, Captopril, Paracetamol, Amlodipine, Lagundi, Loperamide, Co-Amoxiclav, Omeprazole, Ambroxol, Aquatabs, Cetirizine, Losartan, Clonidine, Propranolol and Mefenamic. This project was supported by PagerDuty and Pfizer.



WATCH VIDEO

### Building Low-Cost High-Performance Cargo Drones for Improved Healthcare Delivery in Zambia

Can industrial drones be repurposed into cargo drones for medical cargo deliveries? Chitula and Kelvin from Zambia Flying Labs embarked on a journey to build low-cost cargo delivery drones. Cargo drones currently available on the market are costly and complicated to use, while some can only do one-way deliveries. Cargo drone companies tend to focus on areas with high populations to ensure profitability, which means areas with more dispersed populations do not benefit from aerial deliveries. The team at Zambia Flying Labs conducted research to understand and address the challenges faced by rural areas in healthcare service delivery. Chitula and Kelvin hosted a knowledge-sharing [webinar](#) with the Flying Labs Network and external participants to share valuable tips and knowledge on how to build low-cost, high-performing fixed-wing drones that could be used for different purposes such as medical cargo delivery and large-scale mapping. The team is currently working closely with the Zambia Civil Aviation Authority and have begun the construction of a low-cost, high-performance fixed-wing-based platform for cargo delivery which is in its beta phase. The model drone is designed to achieve about 95 minutes of flight time when using high capacity batteries, covering 20-60 kilometers delivery range with no payload. The experience working on this project has been an immense learning experience for the Zambia Flying Labs, who are happy to collaborate with other Flying Labs and organizations to improve healthcare service delivery in the Global South.

## » EcoRobotics Highlights

The EcoRobotics sector program focuses on drones and data to support localized climate action and resilience, address environmental and conservation challenges and improve agricultural practices. Learn more about EcoRobotics [here](#).

### **A Collaborative Approach to Assess Mangrove Forests in the Indus Delta, Pakistan**

Pakistan Flying Labs partnered with the Government of Sindh, Sindh Forestry Department, VTOL Dynamic, the local community and renowned climate experts to monitor the growth of mangrove forests. Mangrove ecosystems are significantly impacted by industrial waste, port activities and urbanization, threatening their potential to play a vital role in combating climate change. Through methodical aerial drone mapping, the project mapped and assessed different species of mangroves. Outputs such as a high-resolution orthomosaic, Digital Surface Model (DSM), NDVI, and Elevation models helped in evaluating the health of mangroves, population circulation of mangrove species and analyzing gaps for mangrove plantation drive. The Sindh Forestry Department has since adopted the use of drones to monitor the mangrove forest. The department also expressed their desire to further collaborate with Pakistan Flying Labs and other stakeholders for follow-up flights to assess the success of the interventions and in the periodic assessment and monitoring of the mangrove forests using drones. [See blog post](#) and [BBC podcast](#).

### **Saving the Peruvian Jungle from Illegal Logging and Deforestation**

Peru Flying Labs explored their alliance with UAV del Peru, a Peruvian company with extensive experience in drone operations, to collaborate on a project to determine the damage caused by illegal logging in the Peruvian jungle. Extensions of the Peruvian jungle have immensely diminished in recent years due to illegal logging and deforestation impacting the forest ecosystem. The team used drones for BVLOS flights provided by Refinca, a company promoting sustainable reforestation in the Ucayali region. Photogrammetric survey of more than 6,000 hectares of the Amazon land was conducted in 5 days using a long-range UAV to increase the recognition and surveillance of deforested areas and support indigenous populations in the area. The multiple images captured during the flight helped calculate the density of trees per hectare and identify populations affected by illegal logging. The information obtained influenced plans to sustainably plant trees as part of reforestation efforts while also contributing to the repopulation of tree or shrub species for production, protection and provision of environmental services. See [blog post](#).

### **Improving Coffee Yield Using UAV Technology in Uganda**

Climate change has increasingly affected coffee production in Uganda due to rising temperatures, erratic rainfalls which expose coffee trees to more pests and diseases and reducing coffee yields. Other challenges such as lack of access to essential equipment, poor cash flows, and Covid-19 pandemic affected high yields in 2022. Uganda Flying Labs secured the Turning Data Into Action (TDIA) grant to monitor coffee plantations with drones and identify crop health problems that are unseen by the human eye. The team collaborated with the Uganda Coffee Development Authority (UCDA) and the bank to refine the most optimal position for relevant data output and sensitization. This led to a proof of concept to map a commercial coffee farm in Mukono, South of Kampala. 44 hectares of coffee plantation were mapped using a DJI Phantom 4 Multispectral drone. Once processed, the drone data was turned into a Digital Surface Model, Reflectance maps, a 3-D Point Cloud, a Digital Terrain Model and NDVI maps. The data revealed areas with stress, erosion and flood risks while harvest analysis provided a better picture of the expected volume of coffee yields and the number of coffee trees to be replaced. The stakeholders gained new insights on how to streamline the use of drones to improve coffee production and will certainly engage further with Uganda Flying Labs for more exercises on agricultural applications. See [blog post](#).

## » DevRobotics Highlights

The DevRobotics sector program focuses on drones and data to propose new solutions to tackle urban and peri-urban development needs. Learn more about DevRobotics [here](#).



### Turning Drones Into a Multi-sensor for Smart Cities

Kenya Flying Labs, WeRobotics and EPFL's Laboratory of Urban Transport Systems (LUTS) set out on an innovative experiment (probably the largest in an urban environment so far) in Nairobi, one of the most congested cities in the world. The aim of the proof of concept was not to monitor traffic, but to find the causes of congestion and provide solutions based on facts, all based on drone data acquired by a swarm of ten drones. Why drones? Because drones provide excellent visibility, can cover large areas and are relatively affordable. What's more, they offer greater precision than GPS technology and eliminate the behavioral biases that occur when people know they're being watched. In addition, acquiring such data with drones allows to protect people's privacy as the data can be acquired in a way that protects people's identities. See [blog post](#).

### Emerging Technologies for Rapid Urban Growth Planning in Malawi

Malawi Flying Labs used machine learning models that leverage drone data for town and urban planning processes to give local stakeholders access to better tools for tracking and monitoring residential settlements in Lilongwe, the capital of Malawi. With an urban growth rate of 9 percent annually, urban residents have ignored the zoning regulations and town planning requirements, leading to many semi-informal structures being built in areas unfit for such developments. Malawi Flying Labs developed a prototype that allows users to search and index various parameters based on high-resolution drone imagery and maps. The prototype is fed high resolution imagery and can effectively identify a church, warehouse, commercial structure, single storey or multiple storey structure, finished or unfinished structure at 75 percent accuracy.



It can also count structures based on type, location, or proximity to a certain point. The team hopes that this project is just the start of emerging technologies such as artificial intelligence and machine learning to improve town and urban management amidst rapid urbanization. See [blog post](#).

### Using Drones to Mitigate Conflict Between Farmers and Herders in Benin Republic

One of the biggest challenges that farmers and herders face in Benin is agropastoral activities. Crops are regularly destroyed by cattle moving across the country in search of fresh grass and water. This often leads to communal clashes and loss of lives. The communal authorities opted for the realization of a corridor where the movement of cattle does not affect farmers' crops. To find solutions for this challenge which also has a direct influence on the country's GDP which heavily depends on agriculture, Benin Flying Labs worked on a proof of concept to develop a transit corridor path using drone-based cartography. The goal of this project was to map out safe passages and access to water and food for herders and livestock without endangering crops. Following a 10-day drone flight and a follow-up training session at Bante Town Hall, the team engaged the Mayor and land owners for approval of the corridor. The physical establishment of the boundary markers for the corridor has begun. Read more about this project [here](#).



## » YouthRobotics Highlights

*The YouthRobotics sector program aims to raise STEM awareness and contribute to gender balance with robotics and drone-inspired youth engagement programs adapted to local contexts. Learn more about YouthRobotics [here](#).*

### Fly for the Future STEM Program in Ghana, India, Morocco, Senegal and Tanzania

Throughout the year, Ghana, India, Morocco, Senegal, and Tanzania Flying Labs have designed and launched their customized youth training activities for the Fly for the Future program, based on dedicated resources and online training from She Maps and in-person training and support from WeRobotics. The local implementation has been facilitated through collaboration and partnerships with local STEM education providers, universities and community leaders. Funded by Fondation Botnar, the program supports interactive drone awareness sessions, youth networks, youth-led projects and engagement activities with social good employers and relevant stakeholders. In 2022, Flying Labs have engaged with 400+ youths.





### **Ariel & Friends in The Magic of Mangroves - A True Story from Panama Flying Labs**

Panama Flying Labs and WeRobotics made final changes to the first ever book of the Ariel & Friends children's picture book series, a project that has been supported by 106 backers on Kickstarter and self-funded to a large degree by WeRobotics. The book, available in English and Spanish, was published in March and printed copies have traveled to Japan, Panama, the United States, India, the United Kingdom, Switzerland, Germany, and Australia. Over 30 copies have been donated to schools and libraries in Panama by Kickstarter backers and WeRobotics. Panama Flying Labs has conducted a number of activities alongside the donations, including reading sessions by the main characters of the book and STEM training. This donation drive was supported by WeRobotics and the First Lady of Panama, Yazmín Colón de Cortizo. Read more here: [blog post](#), [kickstarter campaign](#), and the [Ariel & Friends webpage](#).

### **STEM Sheroes**

Over the past years, most Flying Labs have implemented very diverse STEM/Youth activities, addressing a wide range of age groups. WeRobotics has actively supported Flying Labs for a number of these programs. Together, we have made many learnings and identified the need for a more holistic approach that allows to have a long-term focus, covers all age ranges with both locally and age-adapted activities and includes the co-creation and facilitation of local STEM ecosystems for maximum impact and sustainability. Thus was born the idea of a new program we call STEM Sheroes. Thanks to a grant from the Beiersdorf Foundation, facilitated through Ashoka, we have been able to test our program idea in the field partnering with Panama Flying Labs in August 2022. Thanks to this test, we are now able to fine-tune the program and will work with 4 Flying Labs in 2023 for first implementation and learning.

# Team & Partners

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## » WeRobotics Team

In 2022, we expanded our core team by adding new areas of expertise that were requested by the Flying Labs Network. We welcomed a new expert to support the Drone Regulations and Policy Engagement with Civil Aviation Authorities and to strengthen the safety culture of the Flying Labs Network. One of our existing core team members shifted to a new role thanks to her studies, building up our internal expertise as well as the expertise of Flying Labs in Monitoring & Evaluation. Her previous role was filled by making one of our intern positions permanent. We welcomed additional interns throughout the year to support the Drone & Data team.

In parallel, and as mentioned earlier in the organizational achievements of this report, we undertook a first step of our organizational reform by closing our project-oriented engineering department in Switzerland. Read more in “Aligning our Organizational Structure with our Strategy” on page 9.

We also expanded the expertise on our Board of Directors by welcoming two new board members, [Dr. Jackie Chimhanzi](#), CEO of the African Leadership Institute and seasoned board member and board chair of a number of other organizations, and [Linnet Kwamboka](#), a leader in the African data community and seasoned entrepreneur, consultant and Mozilla Foundation Fellow.

## » Partners

Partners are essential to our collective success and enable us to expand our impact and scale. In 2022, following new partners have joined the growing [partner ecosystem](#) created throughout the years:

### New Technology Partners:

**Skydio:** Our partnership with Skydio allows Flying Labs to demonstrate the positive social impact they can create for a wide variety of applications using Skydio drones. [See website](#).

**Drone Deploy:** We re-launched our partnership with Drone Deploy through which Flying Labs access cloud-based drone mapping software. This [video](#) is a good example of how the software is used by Flying Labs.

**Redwing Labs:** Redwing designs, manufactures, and operates autonomous drone logistics systems to transform last-mile healthcare supply chains. Their work lies at the intersection of social impact, healthcare, and aerospace. See [blog post](#).

In addition to these new partnerships, we keep on benefiting from strong, highly valuable and long-lasting partnerships with Esri, Pix4D, DroneLogBook, AgEagle and more.

## New Organizational & Strategic Partners:

**Stopping as Success (SAS+):** SAS+ provides WeRobotics with in-kind consultancy services to support our transition strategy. SAS+ supports and equips organizations with good practice to transition responsibly to make way for local leadership in the development sector. [See website.](#)

**AI for Good:** a UN action-oriented, global, and inclusive platform on AI, organized by the International Telecommunication Union (ITU). The “Robotics for Good” programming track aims to explore the applications of intelligent autonomous systems to advance the UNSDGs. [See website.](#)

**Deloitte USA:** Our partnership with Deloitte is for in-kind consultancy services through Deloitte’s skill-based volunteering program called D2interational (D2i), Deloitte Government and Public Service’s (GPS) flagship international social impact program. Jointly, we are collaborating on a first learning project in Namibia. [See website.](#)

**Women and Drones:** The organization enables women (and men) to connect, collaborate and share their work on a global platform. It also elevates the entire drone industry with a strong focus on bolstering diversity, equity and inclusion for women in the drone industry. Our partnership is with the African Chapter of Women and Drones, to jointly advocate for female drone pilots and their work in Africa. [See website.](#)

## » Donors

**Core & Project Donors:** Fondation Botnar, Gates Foundation, Hewlett Foundation, Infectious Disease Institute Uganda, IPAR, PagerDuty, Pfizer Foundation, Save The Children Sweden, the Swiss Federal Institute of Technology (EPFL), Twilio, World Mosquito Program (WMP).

**In-kind donations are an integral part of our income streams. We have received generous in-kind donations from the following companies in 2022:** Autodesk, Digital Kingdom, DroneLogbook, Esri, Global Drone Solutions, Pix4D, Skydio, Hayal Ortaklari Dernegi (YGA). It is important to note that all of these in-kind donations (software, hardware, data, etc.) go to Flying Labs and not WeRobotics.

# **Outlook for 2023**

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We are looking forward to an exciting 2023. Over the first 7 years of our [organizational history](#), we have co-created a strong base and a wealth of practical learnings on how to localize emerging technologies and scale proximate leadership in a new way. We have come far, together with the Flying Labs Network and the 250+ local experts part of it in close to 40 countries... and we know that we will keep on learning all the while having still much to discover on our journey forward.

In 2023, we will embark on the fourth chapter of our organizational (hi)story by transitioning our organization to even more proximate leadership, including within WeRobotics. Doing so will allow us to further build out and strengthen both our and the Flying Labs Network's sustainability and positive social impact. Thanks to the strong base and the needed alignment of our organizational setup in 2022, we feel ready for this next chapter and will tackle following key initiatives throughout 2023:

## » Organization & Strategy

We look forward to implementing the first step of our "Inclusive Leadership / Transition strategy" in close collaboration with the Flying Council, Flying Labs, our team, our Board of Directors and external advisors. To support the transition, we plan to reform our back office and will keep on strengthening our decentralized setup through our Holacracy-inspired approach. An additional highlight we look forward to is the redesign of our website to align its content with the new chapter. We also plan to launch the Proof of Concept for the Power Footprint initiative.

## » Flying Labs Network

The key focus of the year will be implementing the decisions taken and needs validated jointly by Flying Labs and WeRobotics at the 2022 in-person Flying Labs retreat. This will allow us to create new dynamics as the Network keeps on growing. We will also keep on expanding our support for drone data-driven decision making and continue our learnings on how to impactfully support drone regulations and policies in Flying Labs countries. Building on existing and forging new partnerships and collaborations with like-minded organizations will be key to the success of these initiatives.

## » Sector Programs

We will implement new ways of expanding our sector programs by creating our first sector expertise hubs in collaboration with Flying Labs and external partners. We also plan on expanding our STEM/youth programs to support the workforce of the future with first implementations of the newly co-designed STEM Sheroes program.

## » Knowledge Sharing & Storytelling

We know how central storytelling and wide, open sharing is to changing mindsets. We also want to inspire other organizations and new partners to join us on our journey, including by adopting parts, or all, of our Inclusive Networks model. And we plan on discovering new ways of measuring the many ways our and the Flying Labs' work creates positive social impact.

As in the past, our key success factors for this fourth chapter will be to take both a co-creative and an iterative approach to implementing the new strategies, programs and initiatives. We will also make room for intentional "Pause & Adapt" moments throughout the journey to reflect on learnings, within our team and together with Flying Labs. We will keep on documenting our work with the goal to share the path, learnings, successes and failings along our journey as best practices and learning cases.



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