

IDEAS



FOR



**Financing and Implementing
Sustainable Development**

ACTION

2020



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IDEAS FOR ACTION 2020

Financing and Implementing Sustainable Development



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PREFACE

Every year, the World Bank's Ideas for Action (I4A)—a global competition that engages young people (18–35 years old)—receives thousands of proposals from innovative, entrepreneurial thinkers from around the world who are tackling challenges that stand in the way of achieving the Sustainable Development Goals (SDGs). This competition is always a source of hope and wonder. Empowering young people, especially those with innovative ideas, is fundamental to achieving the SDGs. The I4A competition does exactly that.

I4A is particularly important this year, because it reminds us that even during a global crisis, young people are finding solutions to the most urgent problems of our time, with determination and dedication. Because of COVID-19, for the first time in two decades, extreme poverty is rising around the world. The economic fallout from the pandemic may drive another 150 million people into extreme poverty in 2021. Women, children, displaced people, and people with disabilities have been particularly hard hit.

The I4A initiative—sponsored jointly by the World Bank Group and the Zicklin Center for Business Ethics Research at the Wharton School of the University of Pennsylvania—supports efforts to help communities recover, build, and thrive in the future. It connects leading schools of finance and management

with governments around the world, to build partnerships that shape ideas into actions. From providing clean drinking water to contributing to a low-carbon future, the entrepreneurs in this booklet are already finding solutions to global problems.

The World Bank and the Wharton School are delighted to present the seven winners of the 2020 competition, who hail from Africa, Asia, Europe, and Latin America.

- 1. Angel+ Internet-Based Mental Health Platform for Children and Teenagers, by Team P3ACE.** This digital platform aims to promote mental health and well-being in China by providing interactive courses; a supportive online community; one-on-one counseling; and offline therapeutic services for children, teenagers, and their families, especially amid the COVID-19 pandemic. Its chief aim is to address SDG3 (good health and well-being).
- 2. Farm Control and Monitoring Using Drones with Object Detection Capabilities, by Dronagro.** This solution, from Nigeria, uses drone technology to help farmers improve efficiency and yields. By creating images and inventories of farmers' assets, it helps farmers make better decisions about using of pesticide, for example. The innovation tackles SDG1 (no poverty), SDG2 (zero hunger), and SDG13 (on climate action).

3. Novel Solution for Transforming Organic Waste into Healthy Food to Reduce Carbon Footprint, by Cormo Alimentos. Cormo Alimentos, in Chile, is turning discarded stems, leaves, seeds, and vegetable peel into highly nutritious products, reducing food waste and improving nutrition. After observing waste at fruit and vegetable markets, Cormo Alimentos wanted to change how discarded food is used, contributing to the achievement of SDG2 (zero hunger) and SDG12 (responsible consumption and production).

4. Enhancing Literacy & Numeracy (ELAN) in Developing Countries, by Teach the World Foundation. ELAN, a cost-effective learning solution, has been deployed in Pakistan, Bangladesh, and Malawi. Through digital technology and gamification, it delivers English, math, and local language learning to children on low-cost tablets. This highly scalable digital learning solution can be deployed in existing schools and informal learning centers. It contributes to the achievement of SDG1 (zero poverty), SDG4 (inclusive and equitable quality education), and SDG 8 (decent work and economic growth).

5. The Walkie App, by Walkie Team. Walkie, a mobile app developed in the Republic of North Macedonia, connects people with intellectual disabilities with volunteers who support them in pursuing activities such as swimming or going to the park. It targets SDG10 (reduced inequalities).

6. Buy Me Filter, by the Water Will Company. This innovation, developed in Egypt, provides ceramic water filters made from locally made materials to rural communities that lack access to clean drinking water. It aims to provide water at an affordable price while empowering communities to be involved in the production, distribution, and sale of the filters. It contributes to the achievement of SDG6 (clean water and sanitation) and SDG11 (sustainable cities and communities).

7. KAZE Green Economy, by the KABIOF Team. The KABIOF Team makes eco-friendly charcoal from biodegradable solid waste in Burundi. Its innovation reduces deforestation, improves the efficiency of cooking energy, and reduces indoor air pollution. It addresses SDG7 (affordable and clean energy), SDG 8 (decent work and economic growth), and SDG13 (climate action).

The actions each of us takes today to mitigate global challenges will determine our collective success tomorrow. Now more than ever before, we need the voices of young people in development conversations to build a brighter future.



Angel+ Internet-Based Mental Health Platform for Children & Teenagers: Team P3ACE

WEBSITE IN DEVELOPMENT

TEAM
MEMBERS
(CHINA)

**Yan Sun,
Hattie Xu,
Lisha Zu**

OVERVIEW

China's rapid economic and social transformation has created new mental health pressures, with a growing number of children and teenagers presenting with mental illness. The prevalence of mental health problems in China is about 17.5 percent, equivalent to 173 million people, of which about 30 million are children and teenagers.

The Chinese government has devoted resources to promote mental health and well-being. But because of the COVID-19 pandemic, children lost access to counseling services available at school and adults lost access to work-based support.

Angel+ is an online counseling platform to help prevent and treat mental health issues through interactive courses, a supportive online community, one-on-one counseling, and offline therapeutic services. Through these initiatives, we aspire to increase the well-being of adults and children in China, where access to care is limited.

WHAT IS THE PROBLEM?

SDG3 seeks to "ensure healthy lives and promote well-being for all at all ages." Target 3.4 seeks to "reduce by one-third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being" by 2030.

More than 2 million people a year attempt suicide in China. The number has increased among teenagers. Existing mental health services cannot meet the needs of children, teenagers, and their families.

To understand the problem and tackle these challenges, we sent out 1,500 questionnaires covering 40 cities in 13 provinces in China. The results showed that 53 percent of parents were concerned about their child's mental health and early symptoms of behavioral problems, 72 percent of parents gathered mental wellness information through social media but doubted its credibility, and 95 percent of parents are willing to use counseling services but have concerns about the efficacy and cost of treatment.

Use of online mental health platforms has grown in China, with about 28 percent of parents having used online counseling. Only 12 percent of the platforms are exclusively for children and teenagers, however. In addition, the platforms are often of poor quality and suffer from the following shortcomings:

- They have difficulty building trust with users.
- Services lack diversity and customization. Most platforms standardize their services without considering different stages of mental health issues.
- Content focuses on explaining the thought process rather than providing guidance in changing behaviors.
- Information is misleading.
- Accessibility to appropriate resources is limited.



YAN SHU



LISHA ZHU

“Our team is made up of experienced professionals in the fields of social psychology, finance, and operations.”



HONG XU

OUR SOLUTION

We developed a social and psychological counseling resource platform that offers online counseling to children, teenagers, and their families. The site provides a variety of mental health services and customized course modules, interaction with an inclusive virtual community, and easy access to trained counseling professionals. The main objectives of the platform are as follows:

- To make counseling more prevalent.
- To earn trust and reduce stigma among users.
- To provide reliable educational resources endorsed by industry professionals.
- To engage users in multi-scenario course modules to prevent the occurrence of psychological and behavioral problems.
- To provide affordable mental health services and tackle psychological problems at an early stage, in order to avoid subsequent and expensive treatment costs.
- To improve response time and reduce wait time in scheduling one-on-one counseling with mental health experts.
- To democratize mental health services through a digital solution that users can access without limitation.

The name “Angel+” reflects our commitment to serve as a guardian angel for children and teenagers. The site offers four types of services, all provided by certified health institutes and professionals:

- Mental health education: Interactive courses for student self-care and collection of data to help diagnose the problem.
- Counseling services: Online counseling services hosted by university professors and student volunteers, with privacy protection.
- Offline activity resources: Posting of information about reading clubs, interest groups, campus community activities, and so forth.
- Professional therapy schedule channel: Matching of nearby counseling professionals with clients with more serious mental illnesses through online appointments, offline meetings, and online follow-up feedback.

This platform is different from other online health or online educational platforms in the following ways:

- It is designed for children and teenagers. It integrates interactive entertainment into educational content.
- It incorporates course modules customized for different groups (children, teenagers, parents, and students). Psychological health services include prevention, treatment, management, and feedback for children, teenagers, and parents. Academic users can use the site to collect data for research.
- It uses artificial intelligence to pre-screen mental support needs and provide personalized recommendations to users.
- Partnerships with the government and academia facilitate the support of promotional channels and academic resources.

IMPLEMENTATION

To ensure privacy and data security, we do not store information in a way that makes users personally identifiable. Users can apply another name for the purpose of counseling, and their contact information is encrypted.

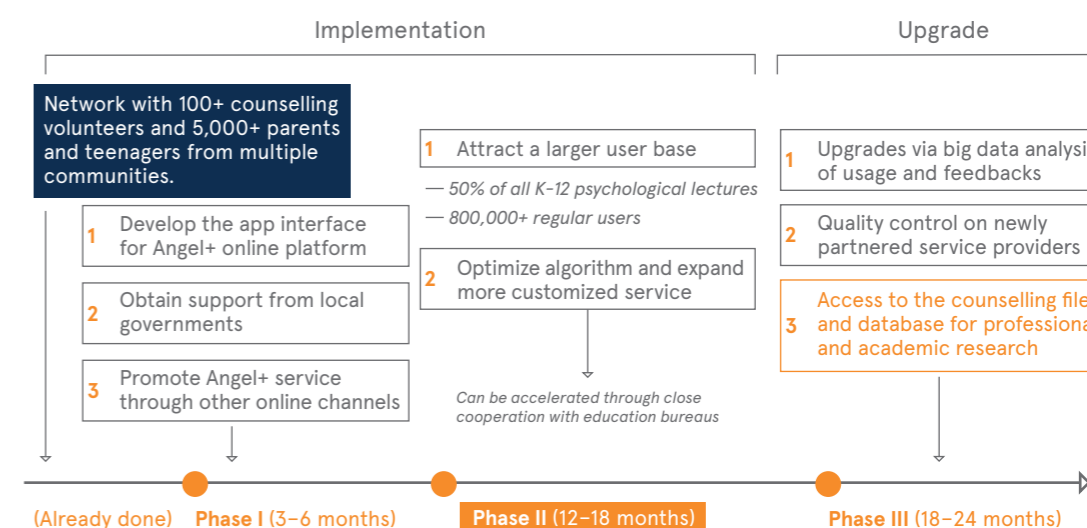
Users and their parents can choose whether or not to disclose their information for research use. Data will enable researchers to better understand and analyze mental problems. We will let parents know that they will benefit from making the data available to trusted research institutions for psychological professionals, in the hope of increasing their willingness to share information.

We have piloted some online initiatives within our network in Shandong. During the COVID-19 pandemic, we used WeChat, a social media platform, to conduct online reading clubs, and host online interest groups. Through these initiatives, we gained feedback from parents and their children. The data collected will be used to optimize the app.

The Angel+ platform has helped many parents and children who were unable to attend school or work because of the pandemic. Our internal survey indicates that more than 95 percent of users said that the service had greatly helped them through these hard times.

We have leveraged social media platforms to recruit users. Once our own platform is ready, we will migrate these users to our own app.

Figure 1.1 Phased implementation of Angel+



COMPETITOR ANALYSIS

During the past decade, a large number of online psychological counseling platforms emerged in China, such as jianfan Xinli and ydl. These platforms connect users with psychological counselors. Only a small part of their business focuses on the counseling needs of families and teenagers, however.

PROGRAM FEATURES AND BENEFITS

We believe our solution will improve the mental health of children and teenagers and help families in China in several ways:

- **Accessibility:** Angel+ has overcome geographical restrictions. We can help more families gain access to mental health education through the Internet. Users have free access to the latest mental health articles. The online forum will publish advice on a timely basis. The scheduling tool features one-on-one counseling and connects users with nearby counseling professionals, helping provide a comfortable consultation environment and improving response time. During the pandemic, the platform replaced more than 80 percent of traditional, in-person office visits with video and audio visits.
- **Affordability:** We provide a one-stop platform for mental support and medical assistance. Most videos, content, and interactive gamified online exercises and psychological tests on the platform are free. The multi-scenario course modules are competitively priced and often cost less than competing platforms. The platform also builds communities in which users are able to share experiences and learn from others who feel the same way and have had similar experiences.
- **Sustainability:** Maintaining active users on the platform is the key to achieving scalability and sustainability. There is also the potential for academics to use the data.
- **Scalability:** In the early stage of the company’s start-up, online educational resources and customized interactive course modules will be our main revenue stream, ac-

counting for about 90 percent of revenue. When the platform generates sufficient cash flow, we will recruit more counseling professionals and design new features for the platform. We need to quickly expand our expert network to scale up the business model beyond Shanghai.

REVENUE MODEL

Our revenue model is based on a survey in which 35 percent of respondents showed interest in our platform and 95 percent of them stated they would use at least one service. To be conservative, we used an adoption rate of 65 percent, based on actual acceptance of invitations to our newly formed WeChat group, instead of 95 percent. The size of the market in Shanghai is 4.27 million people. We estimate the number of initial targeted users at about 1 million (4.27 million * 35 percent * 65 percent). Assuming 10 percent of registered teenagers/parents are active users, we aim to serve 100,000 users with 100 counseling professionals in the first year. We aspire to develop the platform to a scale of 1 million active users and 800 counseling professionals in the next five years and become financially self-sustainable. Figure 1.2 illustrates our projected revenue sources over the next five years.

We expect to build our user base through the following approaches:

- **Close cooperation with schools:** Our pilot benefited from the recommendation of local schools and the participation of psychological teachers from government-subsidized programs. We will collaborate with more schools to develop courses and integrate mental wellness into teaching plans. With the Chinese government's strong support for information-based teaching and the involvement of more schools and local governments, we expect that the user base will grow rapidly.
- **Word-of-mouth in user communities:** In one pilot area, we ran more than 10 WeChat groups and found that more than half of users had joined on the recommendation of other parents. We expect the same thing to occur among teenagers. We plan to launch a number of new features to address the needs of new user communities.
- **Endorsements from scholars:** When the platform has allowed more comprehensive big data analysis and quality control of partnered services, we will provide access to user counseling files and databases to professionals and academic researchers. The role of academic involvement would enable endorsement from scholars.
- **Expansion beyond China:** We will develop online resources in other languages for users in other regions. Using our MBA network, we will first expand to Thailand, which has a similar culture and a high prevalence of smartphone usage. Expansion will increase the database and increase academic cooperation, supporting a sustainable long-term business model.
- **Post-pandemic scalability:** Demand for online counseling is expected to increase as students and parents deal with vaccination anxiety and academic frustration. To ensure that users continue to benefit from our platform, our counseling professionals have focused on post-pandemic anxiety. Their learning enables us to incorporate new elements into online course modules.

CHALLENGES

To reach a larger market, we aspire to be listed as the sole source of mandatory school mental health programs. Although we have established good relationships with local government, reaching this goal will take time. We will continue to increase the number of schools involved and help pilot schools apply for government-funded projects such as experimental teaching demonstrating centers.

Supervisors will conduct regular trainings for less experienced volunteers. We also provide opportunities to pair volunteers with senior in-house counselors so that they can jointly pursue academic research projects on mental health-related topics.

To expand internationally, the platform needs to overcome language barriers and cultural differences. International experts will select articles in other languages. We will also establish an expert network of international counseling professionals as an open-source forum in which experts can share their ideas for addressing cultural differences. Before launching the interactive course modules to international users, we will form a pilot group and observe their journey on our platform. The experts will closely monitor the process and make sure major behavioral differences are fed back into course module design.

Another concern from users is the quality of care delivered through digital services. If our volunteer counselors provide poor services, our platform's reputation will be at risk. To avoid such incidents, we have implemented strict recruitment policies to screen applicants. In addition, we require that all counselors follow standard procedures, starting from knowing the user to documenting the consultation session and following up on progress.

Our team is made up of experienced professionals in the fields of social psychology, finance, and operations; we have limited experience in developing the algorithm for the Angel+ app. Some technology experts in software development have shown interest in our project, but their long-term commitment is uncertain. We will exercise care in selecting our technology partner so that our platform remains stable.





Farm Control and Monitoring Using Drones with Object Detection Capabilities: Dronagro

WWW.DRONAGRO.COM

TEAM
MEMBERS
(NIGERIA)

Francis Maduakor,
Chief Executive Officer

Mistura Muibideen,
Chief Technology Officer

OVERVIEW

Low farm output and productivity have led to increased hunger, poverty, and malnutrition in Nigeria and across Sub-Saharan Africa. Because industrial agriculture is not common, Nigeria loses tens of billions of dollars a year in export opportunities (FAO 2021). Inadequate farm monitoring and recordkeeping are contributing factors, resulting in potential crop losses and loss of livestock from pests, diseases, and theft. Farmers also face security risks.

The Dronagro system allows farmers to remotely monitor their assets, including livestock, vegetation, structures, water sources, ponds, equipment, and farm machines. The system uses interactive data visualization and analytics that are accessible through mobile devices and personal computers to increase farm yields and output.

WHAT IS THE PROBLEM?

Although agriculture employs about 70 percent of the Nigerian workforce, output and productivity remain low and insufficient to feed the country's more than 180 million people. Poor infrastructure is a driving factor in low productivity, with many youths avoiding the agricultural sector because of the crude infrastructure available. Migration to urban areas also contributes to low agricultural productivity.

Insecurity among farming communities is increasing. Nigeria is Africa's leading consumer of rice, one of the continent's main producers, and the largest rice importer in the world (FAO 2020). But many rice farmers are in areas that are prone to attacks by insurgents.

Pest and disease attacks are also major problems. They cause defoliation, a change in color and shape, brown lesions, chlorosis (a condition in which leaves produce insufficient chlorophyll), powdery mildew, and plant stunting. These problems reduce the quality of crops and may discourage farmers from producing.

Most farmers do not know how to keep farm records. Their assets are prone to theft, because some individuals take advantage of the lack of record keeping.

OUR SOLUTION

Using advanced drone technology and computer visioning, our product implements state-of-the-art artificial intelligence technology known as Mask R-CNN to detect and recognize objects. Our object detection algorithm can detect pests and disease symptoms before they cause serious problems. The information on the presence of pests and diseases and the number of livestock, vegetation, and other assets helps farmers make better and more rapid decisions to improve farm efficiency. Farmers can remotely monitor their farm from a safer place, reducing the amount of time they need to be present in farm areas prone to attacks.

The technology works as follows (figure 2.1):

1. A drone is armed with a Raspberry Pi computer system attached to a mounted camera.
2. The drone hovers for a specific time over the farm, taking cross-sectional images of assets as decided by the farmer.
3. The image is uploaded to the digital cloud for analysis or stored on the Raspberry Pi to be uploaded later if there is no internet connectivity.
4. A statistical chart is generated based on analysis of the data collected by the system (figure 2.2).

Figure 2.1 Use of the drone

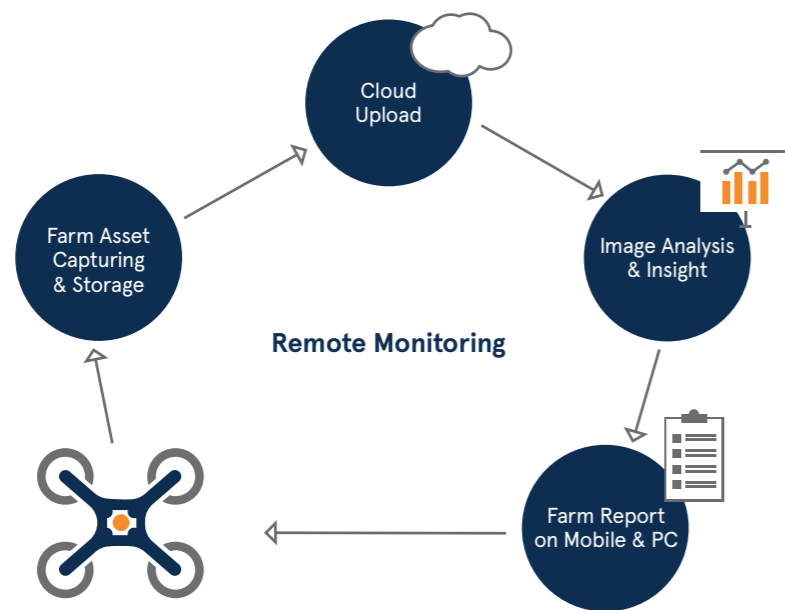
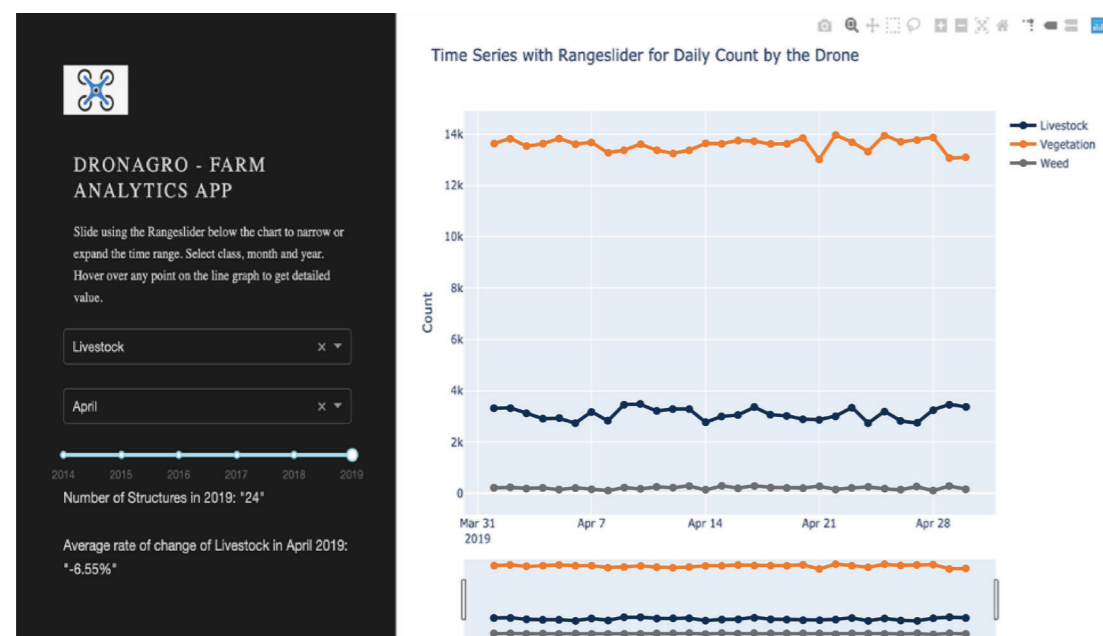


Figure 2.2 Typical farm report generated by Dronagro



Our services make commercial agriculture more pleasant, productive, and easy. Decision making is data-driven, leading to higher yield, growth, and profits. Our services include the following:

1. **Instance segmentation and detection of individual objects:** A bounding box and a mask are drawn around each object, such as a tree or animal; a category name describes the object.
2. **Counting of all similar objects:** The program shows the total number of objects within a category. All livestock are currently classified as "animal." The new version of the model will specify animal types (goats, sheep, cows).
3. **Exact location and geographical identification of assets,** including landmarks, buildings, and structures on the farm.
4. **Identification of weeds and grasses on the farm,** which can be used for weed control and management. The app shows the total number of weeds, which helps farmers know when to take action.
5. **Timely statistical interactive charts,** generated automatically by analyzing the data collected by the system. The app reveals trends on the farm.

TARGET MARKET

Globally, the precision farming market is projected to reach US\$12.8 billion by 2025. Factors driving the growth of precision farming include increased farm mechanization in developing countries; rising labor costs, caused by shortages of skilled labor; increasing strain on the global food supply because of increasing populations; substantial cost savings associated with smart farming techniques; and government initiatives to adopt modern agricultural techniques (Marketsandmarkets 2020).

Our business-to-business approach targets major markets in developing countries, including Nigeria, Uganda, and Ethiopia. Developing countries account for about 70 percent of the world's population. About 97 percent of the world's population growth in the next three decades will occur in developing countries. There is thus an urgent need to increase food production to feed the growing population.

Our target customers include the following:

- **Agricultural consultants:** Companies such as Agramondis Agricultural Consulting, Brunus Enterprises, Blessam Agro Consultant, and SimbiGreens Ltd. are ideal customers because they serve Nigeria and Africa at large.
- **Large modern farms:** There is a growing trend of large-scale farming in Nigeria, as rural people migrate to the cities, leaving more rural land for agricultural purposes.
- **Agriculture institutions:** Institutions that develop innovative agricultural products, such as the National Cereal Research Center, are potential customers.
- **Crowdsourcing agricultural platforms:** New agricultural technology companies like FarmCrowdy and Thrive Agric are growing very rapidly, and so are their farms and investments. These platforms attract investment from interested

Agricultural consultants are our early target customers, because our product would improve the accuracy of their data, enabling farmers to make sound decisions. Our solution would create an enormous new and innovative revenue stream.

REVENUE MODEL

We sell our drones for US\$3,000–\$US7,000, depending on the size and features. We charge a monthly subscription of US\$1,000 for the software.

SCALABILITY

We plan to reach customers in the following ways:

- 1. Existing and direct connections:** We have connections with agricultural consultants and are reaching out to new connections.
- 2. Email marketing:** We intend to introduce potential customers to our product and value proposition using email marketing strategies.
- 3. Social media:** We will employ social media, especially LinkedIn, to connect with contacts, get their attention, and convert them into customers.
- 4. Affiliate marketing:** We will pay commissions to partners who bring us customers.
- 5. Search engine optimization:** We intend to build and optimize the content of our website to increase traffic.
- 6. Forums/community:** We will establish a forum/community to enable agricultural clients and customers to interact and drive value from one another.
- 7. Blog (content library and white papers):** We will build a database of content, including analytics, studies, research, and blog posts, that describe practices, in order to attract potential customers to our product and position us as an industry expert.

SOCIAL IMPACT

Dronagro would create numerous benefits, including the following:

- 1.** Increase the supply of healthy and nutritious food, reducing malnutrition and starvation and saving lives.
- 2.** Reduce the cost of food production, increasing access to food.
- 3.** Reduce waste of resources such as pesticides, fertilizers, water, and weedicides, by using data from Dronagro.
- 4.** Predict yields and outputs, allowing farmers to make better decisions.

COMPETITOR ANALYSIS

We face competition from drone companies—including BeatDrone (<http://beatdrone.co/>), Charis UAS (<https://charisuas.com/>), and PolaDrone (<https://poladrone.com/>)—that offer a broad range of services, including agricultural services. We also face competition from tailored agricultural drone technology companies that provide farm analytics, such as Aerobotics (<https://www.aerobotics.com/>).

Very few of these companies have proprietary drone technology or analytical software. Our product is based on a unique drone technology tailored to end-to-end farm analytics that is easy to operate. Its proprietary software and mobile app provide data interpretation, analytics, and visualization that are easy to use and understand with minimal or no help from experts.

CHALLENGES AND MITIGATION

We have identified several challenges:

- 1.** Farmers are resistant to the adoption of drones.
- 2.** Nigeria and other developing countries have strict drone laws.
- 3.** The political situation is unstable.
- 4.** Farmers fear third parties knowing what assets they own.

Farmers are struggling with technology adoption. Dronagro’s mitigation approach is to educate them to use this technology and give them a practical guide on using our mobile app. We will educate them through television, radio, YouTube, and agricultural extension officers. We will also collaborate with our clients to share their success stories.

Drone laws in Nigeria may affect business delivery. Flight plans must be forwarded to the Nigeria Civil Aviation Authority before conducting individual drone flights in Nigeria. We will be reaching out to the key players to enable us to meet the demand by our customers promptly.

Governmental and political activities in most African countries can change quickly, and strategies adopted by one government administration may be different from a successor, making good relationships with key players at the ministries of agriculture and aviation as well as land and urban development partners essential.

Farmers may be uncomfortable with third-party awareness of their assets. Dronagro is conscious of the need for data privacy and complies with data protection laws. Images captured are not stored forever. We extract an image’s features only for image analysis. Our mitigation approach is to make our process known to clients through our advertising campaign.

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“About 97 percent of the world’s population growth in the next three decades will occur in developing countries.



There is thus an urgent a need to increase food production to feed the growing population.”





Novel Solution for Transforming Organic Waste into Healthy Food to Reduce Carbon Footprint: Cormo Alimentos

[HTTPS://CORMO.CL](https://cormo.cl)

TEAM
MEMBERS
(CHILE)

**Francisca Silva,
Angélica Hernandez,
Gonzalo Letelier**

OVERVIEW

Globally, an estimated 821 million people suffer from hunger every year, and millions suffer from malnutrition while the world loses 1.3 billion tons of food a year to waste. Food waste not only contributes to malnutrition and starvation, it also creates methane, a greenhouse gas emission that is far more harmful than CO₂.

Cormo Alimentos plans to reduce food waste by using research, development, and innovation (R+D+I) to turn the stems, leaves, seeds, peels, roots, and bulbs of vegetables into nutritious food. We work directly with industry merchants through a strategic alliance with the Lo Valledor Wholesale Market, the largest agro-industry market in Chile. Our model facilitates access to the wholesale market and supports logistics to build close relationships with small merchants.

WHAT IS THE PROBLEM?

Stems, leaves, seeds, peels, roots, and bulbs make up a significant portion of the world's food waste. They form part of the global volume of food waste, which is estimated at 1.6 billion tons in primary commodity equivalent. Edible food destroyed is equivalent to 1.3 billion tons a year. The carbon footprint of food waste is estimated at 3.3 billion tons of CO₂ equivalent of greenhouse gas emissions released into the atmosphere per year. The total volume of water used each year to produce food that is lost or wasted is equal to the Volga River's annual volume or three times the volume of Lake Geneva. About 1.4 billion hectares—28 percent of the world's agricultural area—are used to produce lost or wasted food (FAO n.d.). The greatest threat to endangered plants and animal species is from agriculture (FAO n.d.). Methane emissions from landfill, including vegetable waste, represent one of the largest sources of greenhouse gas emissions.

OUR SOLUTION

Cormo Alimentos proposes to apply R+D+I and food and science technology to food discards to create highly marketable, innovative, and nutritious foods. Our process is applicable to any stage of the agri-food industry and adaptable to different contexts and budgets. Given advances in food science and technological processes, it is possible to develop foods in different formats with different characteristics while retaining most nutritious properties.

We have developed four products based on stems, leaves, seeds, peels, roots, and vegetable bulbs: Betaplus, Betasal, ready-to-use beet leaves, and Ñami crackers. The first three products are already on sale through our e-commerce site (<https://cormo.cl/tienda>) and in specialized stores. The fourth is scheduled to launch in the second half of 2021.

1. Betaplus is a condiment made from beet stems that can be used to replace salt. It is high in folic acid, antioxidants, and fiber, equivalent to a daily serving of vegetables.
2. Betasal is an ultra-fine product made from beet stems that is full of vitamins and minerals and low in sodium. It seeks to replace 100 percent of common salt.
3. Carefully chosen ready-to-use beet leaves are treated and made less bitter in order to improve their flavor without losing their nutritional properties. An excellent source of vitamins and minerals, these green leaves are high in antioxidants and vitamin K, which plays a key role in helping the blood clot.

4. Ñami crackers are made from the stems, leaves, seeds, peels, roots, and bulbs of vegetables. They come in pumpkin, green mix, beetroot, and onion. One 30-gram serving is equivalent to one daily serving of vegetables. The crackers are a good source of fiber and protein. They contain a mixture of chickpea and corn flour, full of vitamins and minerals. This product seeks to replace bread at meals.



Our products are based on food that would otherwise have been thrown away.

In 2021, we met with a large Chilean company, lansa, to develop a new product—an insoluble fiber based on lansa’s discards from the production of apple juice and fiber from broccoli stems extracted by Cormo. The product is intended for people who do not receive their daily ration of fiber and people who suffer from constipation. The product’s price is 40 percent less than the competition. The product is sold through our e-commerce site and as an ingredient for food developers.

We have forged alliances with farmers and merchants who supply the waste. Agricultural market administrators ensure the quality and volume of the raw materials. We conduct tests for various sensory characteristics of the raw material.

We conducted market research to evaluate the technical feasibility of products and taste tests to develop the final product. We chose attractive packaging that also ensures that the products are kept safe. Production takes place in sanitary conditions that meet regulations.

We sell our products through specialized stores for healthy eating, gourmet food stores, shops for pregnant women and babies, supermarkets, pharmacies, and social networks and websites.

IMPACT

Our process increases efficiency in the agricultural process and the income of farmers, by paying them for discards. It develops foods that improve health, providing a solution for food health problems that arise from current lifestyles.

CHALLENGES

Market Challenges

A key challenge is slow acceptance by consumers of these novel products. Investment will be made in marketing to inform consumers of the high-quality processes used and to move away from using terms like *disposal*, *recycling*, *waste*, and similar words, which generate reluctance among consumers.

Operational challenges

Standardizing volumes and ensuring the quality of raw materials is difficult. Actions to be taken include creating a standard supply processes by establishing supplier contracts, and ensuring they are paid on time, to formalize processes and build trust.

Financial challenges

Investment in some phases of the process is high. To overcome this potential barrier, we are currently working with strategic alliances to find a solution.

Regulatory challenges

Complying with sanitary regulations requires ensuring that personnel are highly trained.

ADAPTATION TO COVID-19

Because of the pandemic, Cormo Alimentos decided to focus on Betaplus, which is aimed at improving immune response.

RESULTS AND IMPACT

For every 100 grams of finished product, we salvage 1 kilogram of waste. Our products are already selling at competitive prices, and we are working with 14 suppliers; our goal is to increase the number monthly.

SCALABILITY AND FINANCIAL SUSTAINABILITY

Our solution is scalable and also exportable. In 2022 we plan to sell our products in markets across Latin America, with expansion to the United States planned for 2023 and expansion to other international markets planned for 2024.

AWARDS AND RECOGNITION

Our product has won the following awards:

- Finalist in the TIC Americas eco-challenge organized by Young Americas Business Trust (YABT), Organization of America States (OAS), and the Inter-American Development Bank (IDB).
- Chosen among startups supported by the Chilean government
- One of 50 food innovations from Chile
- First place in the Institute of Food Technologists (IFT) Agro Challenge
- Part of "Comprometidos," an initiative that promotes young people as agents of change, organized by Ashoka, Socialab, Unesco, Nestlé, Esset, and Direct TV
- Part of Youth Action Net.

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Enhancing Literacy & Numeracy (ELAN) in Developing Countries: Teach the World

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OVERVIEW

The world is experiencing an educational crisis. According to UNESCO's *Education for All Monitoring Report*, about 1 in 10 people in the world cannot read or write, adversely affecting achievement of the SDGs. The developing world is the worst hit, with millions of children out of school and millions more poorly educated.

Traditional education models cannot solve this problem within an acceptable timeframe. By introducing a combination of eLearning, tablets, smartphones, and gamification, digital technology can be a game changer.

WHAT IS THE PROBLEM?

Globally, nearly 1 billion people are functionally illiterate, and another billion are barely literate. More than 300 million children are currently out of school (UNESCO Institute for Statistics 2019), and half of all children and adolescents are not learning worldwide (UNESCO 2017).

The consequences are devastating. There is a strong correlation between illiteracy and poverty, poor health, and crime. In economic terms alone the world loses more than US\$1 trillion in productivity a year (World Literacy Foundation 2018). The benefits of education are tremendous, with an exponential relationship between literacy and GDP per capita (Cameron and Cameron 2006), as well as other Human Development Index indicators.

The crisis mainly reflects lack of access, quality, and accountability in educational provision. The developing world is particularly affected. A critical constraint is the shortage of more than 69 million teachers globally (UNESCO Institute for Statistics 2016). Learning outcomes are poor, with vast numbers of in-school children underperforming and little accountability in government-run schools.

Pakistan's education crisis is approaching catastrophic levels. It has more than 22 million children out of school (UNICEF 2019). With the population growing by more than 4 million people a year and a literacy rate of 60 percent (Ministry of Finance 2020), 30–40 million more children could be out-of-school by 2030. Meanwhile, learning outcomes for in-school children are very poor, with approximately 40 percent of fifth graders failing to perform at the second-grade level (DAWN 2019).

The COVID-19 pandemic has exacerbated these problems, with 32 million K–5 students affected by school closures in Pakistan (UNESCO 2020). The World Bank reports that closure of seven months would lead to a loss of learning equivalent to 0.7 learning adjusted years of schooling (LAYS). Given that Pakistan already stood at just 4.8 LAYS, these numbers are alarming (Azevedo and others 2020).

Traditional means will not solve this problem in an acceptable timeframe—even if the resources existed. In Pakistan, providing access to 22 million out-of-school children would require more than 87,000 schools and 700,000 teachers (ASER Pakistan 2019)—the equivalent of the construction of 12 schools a day for the next 20 years. There is an imperative need for a rapidly scalable and easily deployable model of education that allows mass access to quality education, with built-in accountability to tackle the global educational crisis with the necessary urgency required.

OUR SOLUTION

ELAN's model is a simple and scalable "functional literacy" solution for students in kindergarten to grade 5 (K-5). It has been deployed with excellent results in Pakistan, Bangladesh, and Malawi, in varied settings, from urban slums to refugee camps and remote Himalayan villages. The model delivers world-class reading, writing, and math applications in a gamified format, on low-cost tablets and smartphones, in a facilitated setting. ELAN students outperform students in traditional schools, achieving at least 1.5 times the learning gains, as measured by independent third parties across time, multiple geographies, and environments. As part of a "think big, start small" strategy, Pakistan is our starting point to establish these models. Ultimately, we plan to expand these models globally, to millions, in a disciplined, phased manner.

Using award-winning gamified applications on tablets and smartphones, our technology does not require reliance on a trained teacher. Our strategy is to create game-changing transformation by leveraging the Big Five of digital learning:

- 1. Universal reach and access:** Mobile and global Internet can take the world's best learning anywhere. We manage learning deployments in three countries, on two continents, from Pakistan.
- 2. Better, faster "self-learning":** The essence of learning is engagement. Digital educational games provide engagement and motivation in unsupervised settings, promoting "self-learning" and 21st century skills like digital literacy and problem solving.
- 3. Portability, adaptability, and massive scalability:** ELAN's low costs, rapid deployment, and standardized technology and training make our solutions extremely scalable.
- 4. Transparency and accountability:** Built-in tracking in digital applications enables accountability. With data analytics, it enables robust monitoring, evaluation, content adaptation, and personalization.
- 5. Higher return on investment:** High engagement means greater learning. On average, ELAN learning gains are 1.5 times those from traditional teaching. Even at equal cost, the return on investment doubles, and costs at scale can be even lower than they are today.

We deploy award-winning, gamified self-learning applications with proven history in partnership with the following developers:

- Footsteps2Brilliance
- Global e-learning Xprize winners KitKit and Onebillion
- Google Read-along
- Curious Learning
- Local language content providers like SABAQ Muse and Taleemabad in Pakistan.

Our program has three deployment models:

1. Maximizing access through one-room micro-schools

Focus: Out-of-school children in marginalized communities without schools/teachers

Launched in communities with large out-of-school populations, this model provides an excellent alternative for children in urban slums, refugee camps, and internally displaced

person (IDP) environments. We rent a room accommodating 25 children, equip it with 25 tablets, hire a teacher or facilitator who is trained in 5 days, and operate 3-5 shifts of 25 children daily. Mobile hotspots provide WiFi powered by solar. We can launch schools for 75-125 students in weeks for US\$10,000-US\$15,000, with annual costs of less than US\$10,000. This model can be scaled very rapidly.

Community partnership and engagement is key, with communities providing space, teachers, and support. In Karachi, Corporate Social Responsibility (CSR) sponsorship funding just allowed us to launch 100 micro-schools. We are planning to expand to 1,000 CSR-sponsored micro-schools by 2025.

2. Enhancing quality in existing schools

Focus: In-school children suffering from poor quality of education

In Pakistan, 32 million in-school children underperform, with more than 40 percent of fifth-graders unable to operate at second-grade level (ASER Pakistan 2019). Our model is deployed in partnership with large local NGOs already operating schools, leveraging their staff, classrooms, schools, and utilities. Incremental costs are less than US\$30 per student per year. Learning is delivered on tablets, using "best-in-class" English, math, and local language content. This model addresses the poor quality of teaching endemic to public schools in Pakistan.

3. Providing mass access on smartphones, for at-home schooling

Focus: Out-of-school children with no access to schools and in-school children needing quality enhancement

Our at-home model was driven by school closures during the COVID-19 pandemic. With more than 50 million children in Pakistan having lost access and tablets being cost prohibitive, ELAN needed alternatives. Despite some drawbacks, smartphones provided an answer, with their massive installed base of more than 23 million in Pakistan. We launched using our existing portfolio of educational games for both in-school and out-of-school variations through existing implementation partners.

The program is managed by facilitators working with children through their parents. We found parents—who are often illiterate—taking great interest in their children's learning gamified learning apps. An unexpected but powerful ancillary benefit emerged here, turning this program into a potential family literacy program.

We are currently testing this model with more than 1,400 children in Pakistan and Bangladesh. Early results have been strong. Focus groups with parents show that the program has been very successful at engaging and motivating children to study despite school closures. Results from weekly quizzes confirm these results.

This model has proven to be ELAN's fastest growing, with massive potential to scale. By 2025, smartphone penetration in the developing world is expected to reach 70 percent (World Economic Forum 2019). This is also our lowest-cost model, with cost per student at around US\$20 per year. With family literacy added, it could be our highest return on investment play. (For detailed cost projections and assumptions of ELAN deployment configurations, see the annex.)



IMPLEMENTATION

All deployment models of ELAN share certain core features.

1. Deployment strategy: Partnering for scale

Partnerships are key to our scaling mission. We partner with large educational NGOs that already have scale, as well as governments. In Pakistan, our partners include the two largest NGOs as well as the federal and Punjab governments. In Bangladesh, we partner with a major NGO serving large refugee populations. Our Malawi partner is the smallest. It operates 16 orphanages.

2. Execution Management

Execution is guided by the following:

- We establish strong governance mechanisms to ensure good execution. They include regular status reviews, dashboards, and problem-resolution mechanisms.
- Training is a critical activity for ELAN. We conduct workshops to ensure that each facilitator or teacher and field officer is well trained to conduct our program.
- A central help desk supplemented by field officers provides troubleshooting and support.

3. Research, Measurement, and Evaluation: Continuous improvement

Ongoing assessments of program effectiveness are core to our methodology. To validate program efficacy and drive continuous improvement, we conduct year-long assessments on all our deployments, using a methodology that measures both relative and absolute progress against a control group. To do so, we partnered with leading research organizations in Pakistan, including:

- Nielsen, a global leader in research.
- Idara-e-Taleem-o-Agahi (ITA), an organization that conducts the internationally recognized Annual Status of Education Report (ASER) survey, Pakistan's most comprehensive study on education.
- The Center for Economic Research in Pakistan (CERP), Pakistan's leading quantitative research Think Tank advising the government and NGOs on data-based reforms.

TARGET MARKET

Ideally, our target market would include everyone who is functionally illiterate. However, our limited resources force us to focus more narrowly. To do so, we asked ourselves where digital learning would have the highest social impact. We considered the following:

- Students in marginalized communities in the developing world suffer from lack of access as well as poor-quality of education.
- The effects of poor accountability are exacerbated in the developing world.
- Students in the developing world are also at increased risk of learning loss, made even worse by the COVID-19 pandemic.

Given this, we decided to target the developing world, where the educational crisis is at its worst and there is a high need for a scalable learning model ensuring democratization of access to quality education. We concluded that we could provide the greatest value to

children by putting them on the learning path using ELAN to give them functional literacy with a K-5 education. Our learners fall into two categories:

- Out-of-school children in marginalized communities with no access to education
- In-school children struggling because of the poor quality of traditional schools in developing countries.

Table 4.1 Size of target market for ELAN, 2020

IMPLEMENTATION MODELS	TARGET MARKET	SCORE OF TARGET MARKET (PAKISTAN)
IN-SCHOOL MODEL	in-School Children suffering from a lack of quality primary (K to 5) Education	32 MILLION
MICRO-SCHOOLS MODEL	out-of-School Children in vulnerable/marginalized communities	22 MILLION
AT-HOME MODEL	in-School Children affected due to COVID-related school closures and Out-of-School Children	54 MILLION

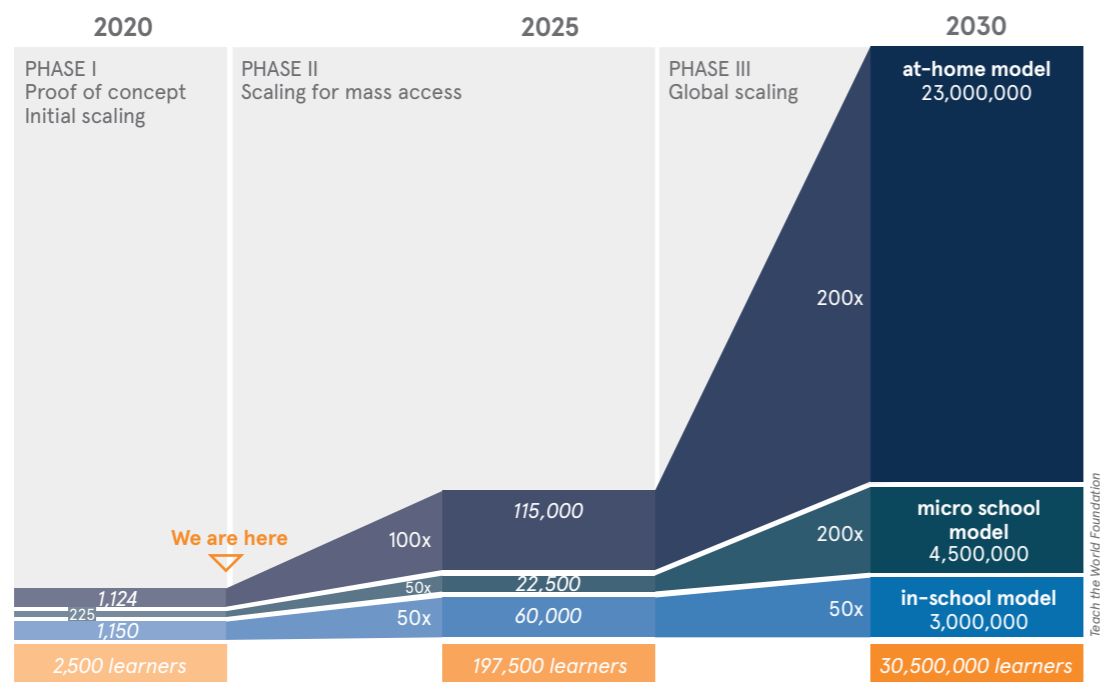
SCALABILITY

We have built global scalability into our model to allow us to deploy to millions rapidly in the following ways:

- We work with large local educational players as implementing partners, whose infrastructure we use. Working with partners means that we do not have to invest in brick-and-mortar schools and yields greater mobility and transferability of the model.
- We do not rely on teachers. Our program can be run by a very lightly trained facilitators.
- We use a flexible deployment model that is rapidly deployable in formal and informal settings. Our model can be deployed anywhere, from a shelter to a hut, a tent, or an existing school.
- We maximize technology and facilitation for cost-effectiveness. We leverage existing infrastructure—existing spaces or multiple shifts—and therefore require limited capital investment (in tablets and software, training, and supervision). Our at-scale cost per student will be around US\$30 a year for our current operations—much less than what governments in developing countries spend on education per child through existing systems.

Given the scalability of our micro-school and at-home smartphone models in particular, we have set an ambitious target of more than 30 million learners by the end of the decade, as we anticipate widespread adoption of the ELAN model by deployment players in the developing world (figure 4.1).

Figure 4.1 ELAN expansion plan through 2030



Phase I: Proof of concept and initial scaling

ELAN's idea has always been to create a digital model for functional literacy that can be scaled globally with minimal resources. However, this idea needed to be tested for scale first, so we began with a proof of concept pilot in 2016, with 25 children at a government school in Karachi. After the success of this pilot, we scaled to almost 2,500 K-5 learners in three countries, an increase of 100 times over four years.

Phase II: Scaling for mass access

Our target over the next five years is to scale for mass access. While sticking with our primary target market of K-5 learners, we aim to scale our micro-school and at-home models by a factor of 100. We aim to scale our in-school model by a factor of at least 50, as we anticipate resistance to change from existing traditional models.

Phase III: Global expansion

By 2030, we aim to replicate our model globally by branching out to more developing countries and catering to a diverse range of geographies around the world.

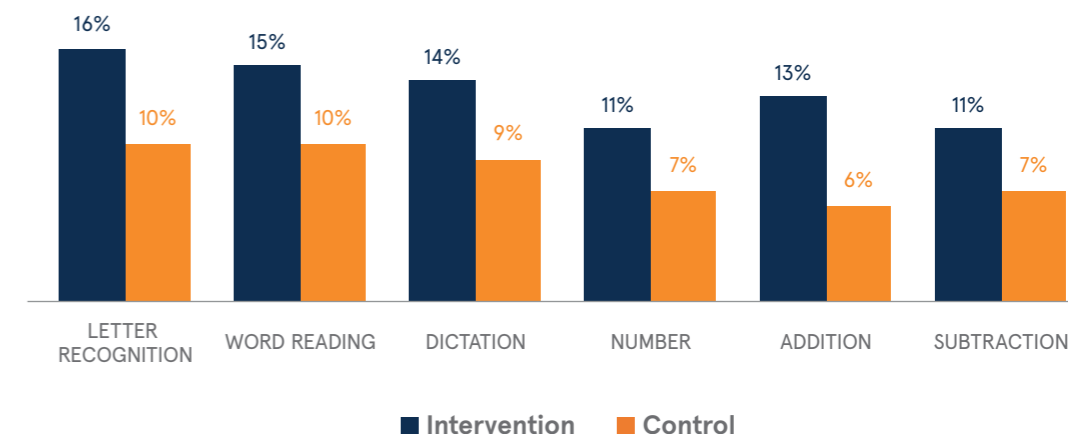
IMPACT

ELAN started as a proof-of-concept at a school in Karachi. Following successful outcomes, it was deployed in three countries and varied geographies and environments, such as refugee camps, urban slums, orphanages, and Himalayan villages, with similar results.

Our most recent evaluation in Pakistan, our key area of focus, shows the impact of ELAN on K-2 students in Lahore and Islamabad. Students were assessed digitally using SurveyC-TO, an assessment tool designed using the Early-Grade Reading Assessment (EGRA) and Early-Grade Math Assessment (EGMA) frameworks developed by USAID. Tools were further

modified by the Center for Economic Research in Pakistan (CERP). The results, shown in figure 4.2, indicate that learning gains were 1.5 times greater among intervention group students than in the control group students.

Figure 4.2 Average learning gains in intervention and controls school in Lahore and Islamabad, 2019-20



In Pakistan, ELAN will create and enhance lasting social impact by:

1. Enhancing economic and social well-being

- We expect improvements in education to increase employability, improve health, and reduce poverty and crime.

2. Accelerating access to education

- ELAN enables accelerated expansion of access to education, through its strong scalability.
- ELAN has powerful "democratization" potential. It provides high-quality education to the underprivileged, which is rare in developing countries, reducing the gap between elite schools and under-resourced public schools.
- ELAN's "self-learning" feature promotes the development of digital literacy, creative thinking, problem solving, self-confidence, and social-emotional learning.

3. Empowering girls, women, and communities

- A key aspect of ELAN is increased female literacy, as we mandate a 50-50 male-female ratio. In some communities, our at-home program provides education to girls who are kept from going to school because of cultural taboos.
- Our at-home smartphone program focuses on family literacy targeting the child, mother, and father, who are often illiterate themselves. This was an unexpected benefit that emerged from our at-home model.
- ELAN's micro-school concept promotes extraordinarily high community engagement and empowerment. Our first two micro-schools were initiated at the request of communities that have become partners in our mission and have provided space, teachers or facilitators, and other support.



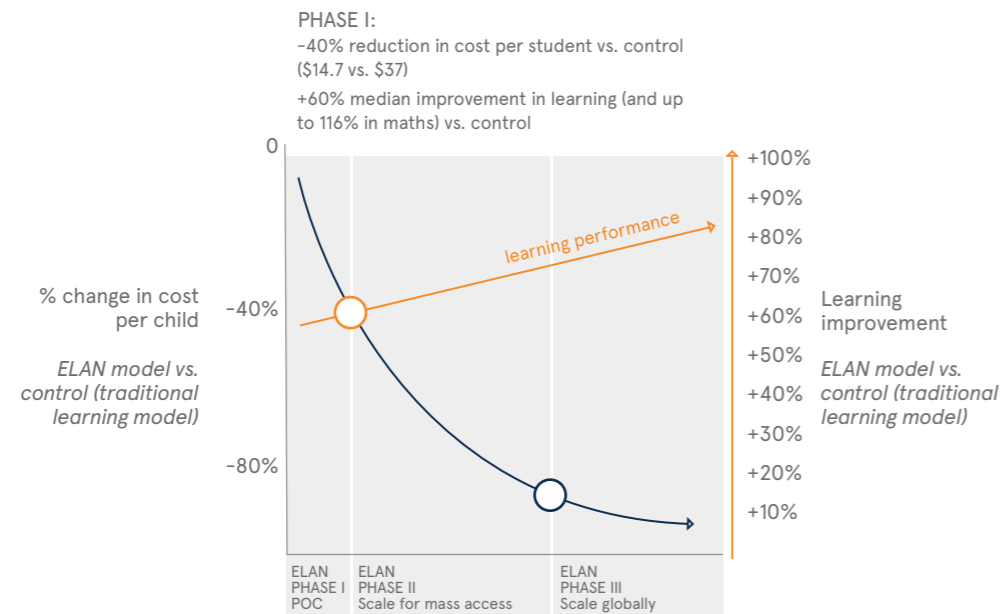
“The world is experiencing an educational crisis. About 1 in 10 people in the world cannot read or write.”



FINANCIAL SUSTAINABILITY

The financial sustainability of ELAN is very high. Cost is very low; at scale, the annual cost per student ranges from US\$20 (smartphones) to US\$60 (in-school and micro-schools)—half what other public or private organizations spend on education in Pakistan. Significant funding is currently available, which is being channeled into traditional modes of education. We are confident that over time this spending will be shifted to new models of education like ELAN, as they provide greater learning returns and decreasing per student costs. Our challenge is to fund the transition from the old to the new models. Figure 4.3 shows the return on investment of the program in Lahore and Islamabad.

Figure 4.3 Return on investment of the ELAN flagship tablet program in Lahore and Islamabad



Currently, we are sustaining ELAN through multiple means. Our micro-schools are funded by corporate donors under their CSR programs. In Pakistan, we have had strong support for micro-schools from other corporate donors, educational NGOs, and philanthropists. Our in-school programs are being run with existing established NGOs, which will scale our programs. Our smartphone program, which is new, is being funded through existing donors (individual philanthropists, CSR support, and online crowdfunding).

To scale ELAN, we are confident that we will be able to leverage the considerable funding available from large foreign aid agencies and educational foundations, which are constantly looking for better models of learning that provide enhanced outcomes and greater return on investment.

We have also begun a program in which we charge a small annual fee per student to institutions with which we work. As learning through digital means continues to improve and costs fall, programs like ELAN will attract more funding and donations through both institutions and individuals.

COMPETITOR ANALYSIS

The true competition for ELAN is traditional schooling, over which ELAN has many advantages (table 4.2).

Table 4.2 ELAN versus traditional models

	RAPID SCALABILITY	TEACHER-DEPENDENCE	INFRASTRUCTURE-DEPENDENCE	HIGH ENGAGEMENT/Self-LEARNING	REAL-TIME FEEDBACK AND ASSESSMENT	HIGHER ROI
ELAN	✓	Low	Low	✓	✓	✓
Traditional Education Models	✗	High	High	✗	✗	✗

CHALLENGES AND MITIGATION

Table 4.3 shows the challenges ELAN faces and what we are doing to mitigate them.

Table 4.3 Challenges facing ELAN and efforts to mitigate them

CHALLENGE	MITIGATION
COVID-19	
School closures cause potential learning loss	ELAN's smartphone program provides at-home learning.
Funding	
Considerable funding will be required to implement ELAN's three-phase expansion plan.	We are currently sustaining operations through high-net-worth individuals and corporate social responsibility. Going forward, we will rely on them as well as foundations, international development grants, and public sector funding. We are also introducing revenue-generating user-fee models to cover some cost.

Public sector adoption/political challenges

Bureaucracy and red-tape hamper innovative models.

Moving from a centuries-old learning model encounters a status quo mindset and resistance to change.

Governments are more open to digital learning post-COVID. We have established partnerships with the governments of Pakistan and Bangladesh, which are providing support. In Pakistan, we are creating coalitions involving businesses, government, nonprofit organizations, education players, and aid agencies to solve education issues.

Perception/mindset

Teachers, parents, other stakeholders are unaware of the benefits and resistant to change.

Teachers fear job losses.

Teachers and parents have doubts about the efficacy of digital learning versus textbook-based learning,

Development agencies are reluctant to invest in new digital learning solutions.

We have organized awareness campaigns to highlight the effectiveness and potential of digital learning. COVID-19-induced school closures have increased awareness.

We are working on gaining teacher buy-in by involving them in change, training them as digital facilitators, and increasing their digital literacy.

We are developing programs to educate parents and get their buy-in by highlighting assessment results and emphasizing digital learning as an integral part of the future world.

Power

Some neighborhoods in which we operate lack electricity.

We are ensuring that our micro-schools are self-reliant by installing solar panels that power lights, fans, and charge electronic devices.

Connectivity

Some localities in which we operate have poor or no Internet connections.

We use offline solutions where Internet connectivity is poor.

We use internet hotspots and satellite Internet, which allows students to periodically upload engagement data and download app updates.

Content

Good-quality localized content is scarce in the developing world.

Gamified learning content does not cover all student learning outcomes or the national curriculum.

Very little content is available for higher grades.

We are tracking competencies covered by our solution and using other supplementary applications to fill the gap.

We are partnering with content developers to produce localized content.

As digital learning grows as an industry, better and more content will become available.

We are looking out for new apps and content in the market. It is easier to upgrade or replace content digitally than in traditional textbooks.

ANNEX: COST PROJECTIONS AND ASSUMPTIONS

Table 4A.1 shows the estimated cost of the three ELAN deployment models when we reach scale. They reflect costs in Pakistan; actual cost would vary by country.

The table shows the incremental cost of launching the ELAN program. We have not attributed costs to resources that are already available. For example, if teachers in our partner school are acting as facilitators of the ELAN program, we do not include them as a cost, as the school would pay their salary regardless of the ELAN program. Similarly, we do not include the cost of devices, such as smartphones, that parents have purchased for their own use, even if they are being used for a couple hours a day to educate their children for the ELAN program.

Table 4A.1 Estimated costs of ELAN (US dollars)

COST COMPONENT	MICRO-SCHOOLS (AVERAGE 75 STUDENTS ACROSS THREE SHIFTS)	SIN-SCHOOL PROGRAM (AVERAGE 300 STUDENTS ACROSS THREE SHIFTS)	SMARTPHONE PROGRAM (PER STUDENT)
Technology	1,530 ^a	6,120 ^a	15 ^b
Program management	2,635	2,150	3
Program support	425	1,200	2
Total annual cost	4,590	9,470	N/A
Annual cost per student	61	32	20

Note: We assume that the cost of a tablet is US\$60, that it lasts three years, and that three students share a table, so that the annual cost of a table is US\$10.

a. Tablets, headphones, content, and internet.

b. Content, memory card, and internet.

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The Walkiie App

[HTTP://WALKIIE.MK/;](http://walkiie.mk/)
[HTTP://WALKIIE.COM/](http://walkiie.com/)

**TEAM
MEMBERS**
(REPUBLIC
OF NORTH
MACEDONIA)

**Elena Bozhinovska,
Dzvezda Ivanova,
Laze Dimov**

OVERVIEW

An estimated 200 million people—2.6 percent of the world’s population—have intellectual disabilities (Special Olympics 2019), and the number is increasing (Zablotsky, Black, and Blumberg 2017). These individuals cannot independently perform activities they would like to do and often face difficulties socially interacting with others.

Our project seeks to address SDG10, which aims to reduce inequality within and across countries. It calls for reducing inequalities in income as well as inequalities based on age, sex, disability, race, ethnicity, origin, religion, or economic or other status within a country.

WHAT IS THE PROBLEM?

Young people with intellectual disabilities depend on others to perform daily responsibilities and are usually excluded from participation in social activities. The biggest problem they face is the mobility required to participate in activities.

People with intellectual disabilities have a lot of free time, but they do not have the means to use it. Even if they do, they need support in performing these tasks and it is not often available.

Figure 5.1 Main problems Walkiie addresses

“My mother and father go to work.”

“I’m afraid someone won’t like me.”

“The educator can’t join me, she has to look after the other children.”

“My mother won’t let me go, so I don’t get lost.”

“I can’t get on the bus.”

The consequences of these problems can be serious, affecting both psychological and physical health. During the three years of our voluntary work, we witnessed the following:

- People with disabilities often feel rejected.
- People with disabilities sometimes get into verbal and physical conflicts with each other and with other people.
- People with disabilities sometimes fall into bad habits, such as gambling and alcohol and cigarette use.
- People with disabilities often suffer from depression and anxiety.



Sheza:

“I like to dance, sing, and go to the theater, but I can’t do it alone. It would be easier if there is someone with me while doing these activities.”



Luka:

“I love to photograph landscapes and people. But I cannot go out alone and do it. I need assistance.”

Emanuela:

“I really want to go to the park or hang out with my friends. But I need to wait for my parents to return from work—and when they come, they are usually tired.”



OUR SOLUTION

With the goal of encouraging social inclusion, our team created Walkiie, a mobile application that is currently available on the Google Play Store. The app connects people with disabilities or their parents or guardians with trained volunteers who can help them leave their homes or institutions to perform regular activities in an easier and safe way. With the help of Walkiie volunteers, people with disabilities have more independence and the ability to be more involved in everyday life.

Walkiie functions in the following way:

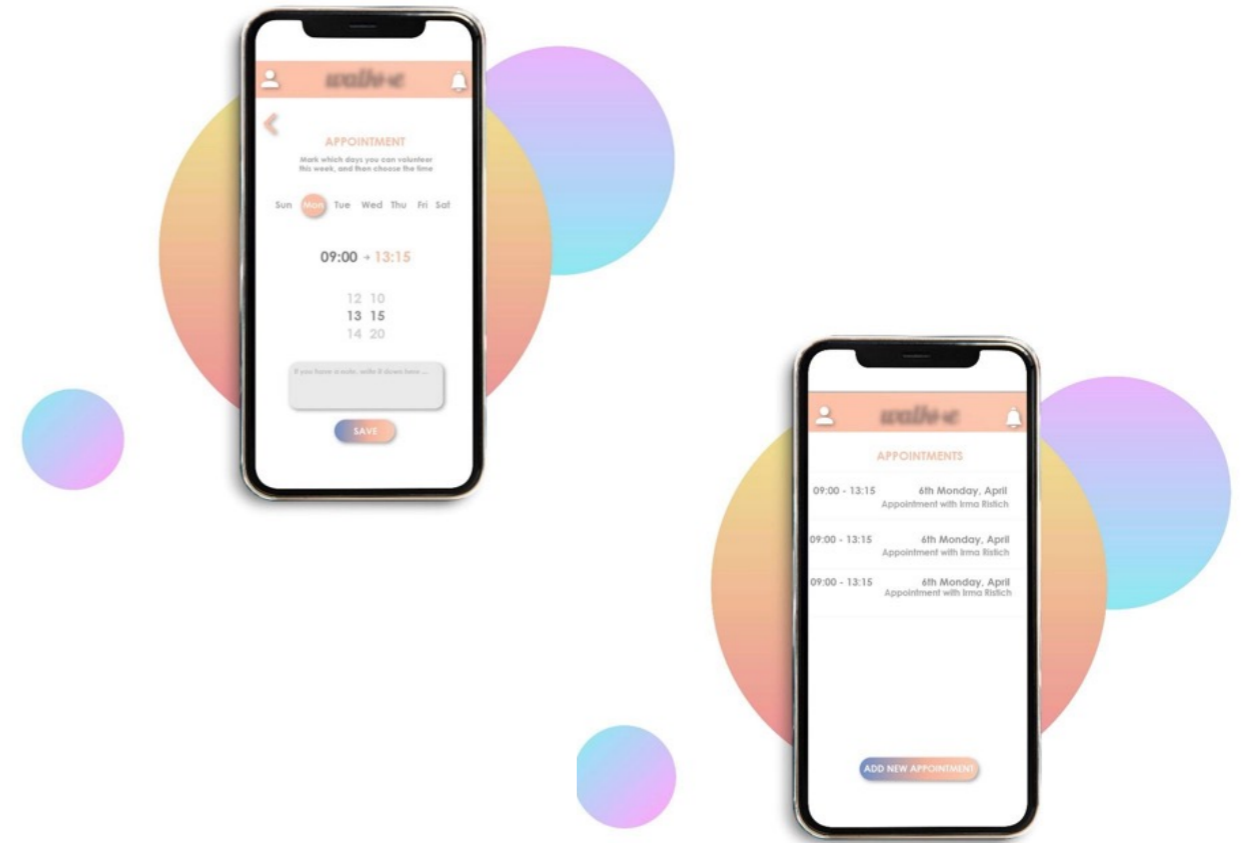
- 1. Create a profile:** You indicate whether you are someone needing assistance or a volunteer. You then enter your name, gender, date of birth, e-mail, and password and upload a photo.
- 2. Identify yourself:** You indicate whether you are a person with autism, Down’s syndrome, or other intellectual disability; a person with combined disabilities; a volunteer with the Red Cross; a volunteer with another NGO; a volunteer with other experience; or a volunteer without experience. You then enter your contact number and a short biography.

3. Choose the volunteer: The person with the disability looks at the list of volunteers and chooses one to work with.

4. Volunteer accepts or declines: The volunteer accepts or declines the invitation to meet. If the volunteer accepts, the client and the volunteer agree on a time and place to meet.

After arranging the meeting through the application, the volunteer goes to the location, takes the person to the place he or she wants to visit (for example, the park, the theater, or a café or for a walk with friends). After the outing, the volunteer brings the client home.

With the help of Walkiie volunteers, people with disabilities have more independence and the ability to be more involved in everyday life.



Volunteers and people with intellectual disabilities make appointments to meet using the Walkiie App.

We have held 30 online workshops with about 15 people with disabilities in each workshop and about 20 volunteers separated into groups of up to 5 people per workshop. In the online workshops, we discuss various activities, such as learning colors in English; learning dances, such as ballet, Zumba, tango, and hip hop; drawing; listening to music; playing educational and fun games; and learning kitchen utensils and traffic signs.

STAKEHOLDERS

Our target group includes three groups of direct stakeholders: people with disabilities who need help and support, the families or caregivers of people with disabilities, and volunteers. Indirect stakeholders include:

- nongovernmental organizations that have social inclusion as their main goal
- state institutions that care for people with disabilities
- educational institutions at which people with disabilities study
- investors and financiers who have included SDGs, especially SDG 10, as one of their objectives.

IMPACT

Through the Walkiie App, we have a chance to change the world for the better and make the daily lives of people with disabilities easier. Our application brings society one step closer to improving social inclusion for this often stigmatized group of people.

SCALABILITY

Our vision for scalability for the Walkiie App is to make it a platform that organizations from around the world can use to help people with disabilities. We have ambition to reach at least 1 percent (about 2 million) of people with intellectual disabilities by the end of 2026.

The way we will do this is by contacting potential partners and others working on SDG10 and presenting the application, through short tutorials, videos, workshops, and trainings, so that they can see how Walkiie works and how they can train volunteers from their own countries to use it. By working with multiple partners, we hope to expand Walkiie globally and help millions of people with disabilities worldwide.

COMPETITOR ANALYSIS

Applications such as Choiceworks, Be My Eyes, Samsung Look at Me, HearYouNow, and Proloque2GO help people with disabilities perform tasks. Some of the applications enable routine scheduling and execution of complicated tasks through visual scheduling of pictures or videos. None of these applications facilitates the mobility of people with intellectual disabilities, however, or connects them with volunteers. This feature makes our application unique.

CHALLENGES FACED DURING THE PANDEMIC AND EFFORTS TO MITIGATE THEM

The Walkiie App faced many challenges during the COVID-19 pandemic. Quarantines, lockdowns, and social distancing restrictions made it more difficult to realize our mission. We had to find an alternative for social activities by people with intellectual disabilities, who were significantly affected by the virus.

We decided to conduct our activities virtually. We started #walkiie virtual socializing. Our trained volunteers and youth workers created themed virtual events and interactions of an informal nature. These one-hour virtual events have a theme, agenda, and list of needed materials prepared in advance. Participation is free. The events are usually conducted via Zoom, in small groups.

Despite the pandemic, the Center for Youth Activism Krik (CYA KRIK) held its annual outdoor summer camp in 2020. We were invited to present our application and test it for the first time.

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Buy Me Filter: Water Will Company

WWW.BUYMEFILTER.COM

TEAM
MEMBERS
(EGYPT)

**Mohanad Hesham,
Mohamed Fathy,
Hesham Sadek**

OVERVIEW

Every day, 700 children under the age of five die from water-related diseases, such as diarrhea (UN Water n.d.). More than 102 million people depend on lakes or contaminated surface water bodies as their main source of water. By 2030, 700 million people worldwide are projected to be displaced by intense water scarcity. We estimate that about 21 million Egyptians living in rural areas cannot afford the cost of traditional water filters.

The Buy Me Filter is a ceramic water filter developed by Water Will, an Egyptian social enterprise that develops innovative solutions for water-related problems around the world. The belief that powers Water Will is that clean water access is a basic need for every human being that cannot be neglected.

WHAT IS THE PROBLEM?

Access to water is very limited in rural communities in Egypt. Our research found that the water network and infrastructure are aging and undermaintained. In remote areas, pipes and shallow wells mix with sewage, causing disease, including diarrhea and kidney failure. Eighty percent of diseases in Egypt are related to unclean water and sanitation, and an estimated 4,000 children die every year from diseases related to unclean water. In Egypt, 7.3 million people live without access to clean water (UNICEF 2014).

In more remote and dry places in Africa, local communities use contaminated rain water that contains bacteria, viruses, clay, mud, sand, and animal waste, a practice that can cause disease.

OUR SOLUTION

Our project aims to produce sustainable and cost-efficient water filters in order to improve the economic conditions and prosperity of businesses and communities. People in rural areas depend on charities and NGOs to provide them with life essentials.



Water before and after filtration using the Buy Me Filter.

Our business model is different. Through an inclusive model of economic development, we empower local communities by partnering with them instead of treating them as beneficiaries. Our community partners are involved in the production, distribution, and sales of our filter, empowering them economically, and raising their awareness about the importance of water, sanitation, and hygiene (WASH).

The Buy Me Filter is a ceramic water filter treated with nanoparticles, manufactured from eco-friendly components such as clay and sawdust. It is developed and manufactured by Water Will, based on Canadian technology. In 2019, our team traveled to visit a Canadian research and development organization to study the technology of the filter. We then went to Kenya to visit a Kenyan ceramic filter factory, where we learned about the production and manufacturing process of the filter on the ground. After returning to Egypt, our research team developed the filter to suit the Egyptian market and context, as Egypt's water faces both chemical and microbiological issues, such as bacteria, not just microbiological issues, as in many other African countries.

Figure 6.1 Use and function of the Buy Me Filter

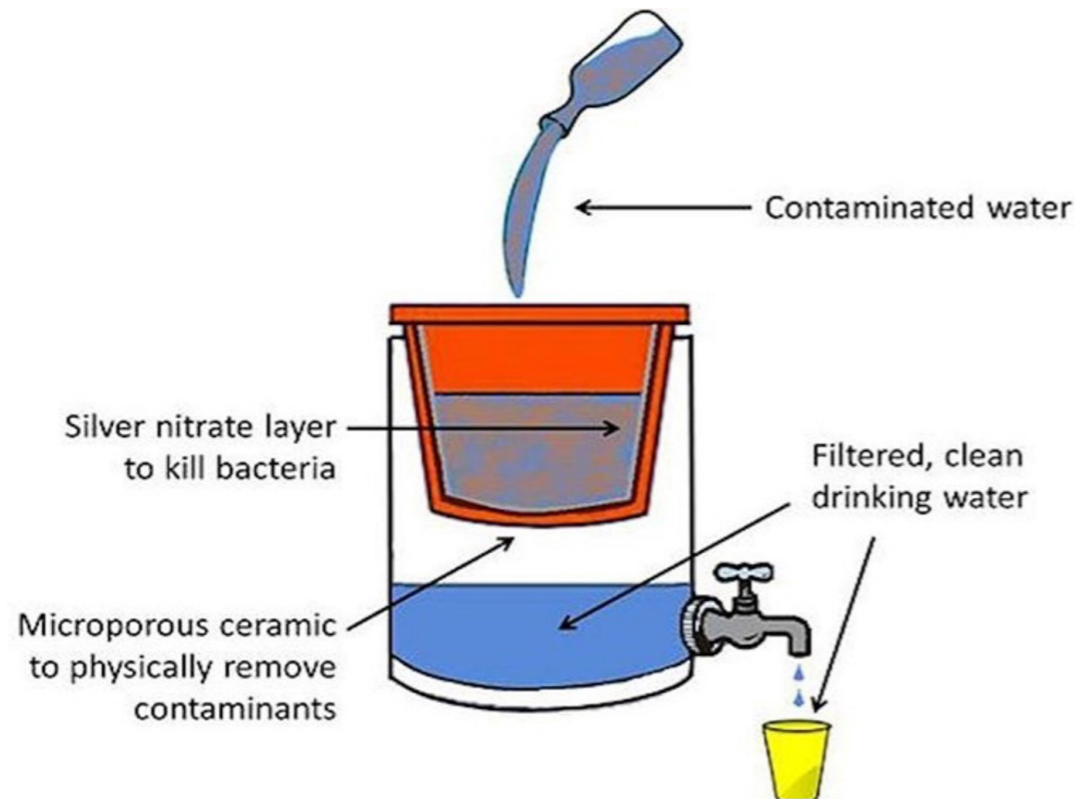






Figure 6.2 Three-dimensional design of the Buy Me Filter



Figure 6.3 Advantages of ceramic water filter with gravitational filtration

- 
Nano particles
 99% effective on Bacteria, cysts, and particles
- 
Sustainable Solution
 Can sustain up to 2 years with minimal maintenance
- 
Easy to use and culture fit
 Does not need power source neither a training to install it
- 
Cost –Efficient & Recyclable
 Cost is : 320 LE < 1/3 Cost of alternative

The ceramic filter is made of carefully selected types of ceramics mixed with natural ingredients sourced from the same environment, making filtration a natural process. It is coated with nanoparticles to kill bacteria and viruses. The filter can go for two years with minimal maintenance. An additional filtration pad is used to remove color, smell, and taste.

Cultural resistance was a big challenge. To reduce it, we explained the idea of the filter and its uses to local communities. They showed a good understanding and acceptance of the idea.

We constructed our factory in Egypt in 2019 and acquired the machines, tools, and materials necessary to produce the filter. Natural materials such as clay and sawdust are carefully selected from the same geographic area as the water source, in order to ensure the effectiveness of the purification process as well sustainability and locality. One filter produces 60 liters of water per day and does not need electricity.

TARGET MARKET

Our team conducted community-based participatory research to define the market needs and size of the market. We fed the research into our product development stage, optimizing our filter to meet the needs of the market. We performed research and experimented with a pilot of our first model, in liaison with international partners from Canada. We have completed a pilot phase to test our prototype and have distributed the filter through local dealers in many communities in Egypt. To date, we have manufactured and distributed more than 400 filters in Upper Egypt, providing clean water to more than 2,500 people. We hope to eventually reach 21 million of the 55 million Egyptians living below the poverty line.

PROGRESS TO DATE

We have carried out the following activities:

- We raised US\$55,000.
- We conducted market research to define our target market, which provided valuable feedback and helped us align our product with our market.
- We conducted research to develop the filter for individual and family needs.
- We built our prototype and launched the first phase of our project to distribute 150 filters to communities.
- We established partnerships with local dealers in the community.
- We launched our website (buymefilter.com) and began promoting and selling the filter in January 2020.
- We developed the factory and the production process for the filter, with feedback from our customers.
- We sold 400 filters.



Local women bringing the filters to their homes.

Currently, we are working on patenting our technology, building our business model, and partnering with other companies and NGOs.

IMPACT

Our filter provides communities with a clean, sustainable source of water. We work with them to achieve national targets set for the SDGs.

We empower local communities by engaging them and helping them become independent. In community capacity-building programs, we will focus on teaching users about WASH and how to replace bad habits with more better ones to reduce poverty and pollution.

We are improving economic conditions by training communities on the production phases of the filter, helping them understand its mechanism, allowing them to serve as distribution channels for others, and making them partners in sharing the profit.

The project has created 10 jobs so far, for a mechanical engineer, laborers, market researchers, legal affairs officers, a marketing specialist, and research and development specialist. We estimate another 15 jobs will be created in the next year, including market researchers, sales representatives, and an online marketing team. More than 100 families are now trained on how to use the filter and maintain its cleanliness, giving more than 2,500 people access to a clean source of water.

SCALABILITY

During project planning and prototyping, we were keen to incorporate both scalability and flexibility in order to replicate this project elsewhere in Egypt as well as in other countries. The filter is made up of locally sourced natural materials in the targeted communities, to fight contamination such as bacteria, minerals, salts, and turbidity. Wherever our filter is replicated, our research and development team will customize filters based on local natural materials.

Our manufacturing process is simple so that we can produce it in or near communities. This will reduce shipping costs, avoid shipping risks, and provide local employment. Our business trainings are transferable and can be implemented in other regions and countries.

The project can be replicated in multiple ways. Constructing local factories using our model involves local communities in the production and sale processes, facilitating access to clean water and economic empowerment. We also plan to increase empowerment and employment opportunities by building a local ceramic filter warehouse close to our production facilities. We are partnering with an African clay filter warehouse.

Our team has already expanded and replicated this initiative in Kenya. In January 2020, Water Will, in collaboration with the Life from Water Foundation, distributed 500 filters to rural communities there.



Our project distributed filters in Kenya in January 2020.

COMPETITOR ANALYSIS

Minlo is the market leader in Egypt in producing and selling water filters, represented by brands such as Tank and UNO. These brands target people in big cities, where awareness, incomes, and purchasing power are higher than they are in poor rural areas. Imported products or replicated local products are sold in rural communities through informal trade.

Our product targets rural communities and is made from natural resources. It requires no maintenance and no electricity and costs less than other filters, with a lifetime of two years.

Through the years, we have seen great opportunities to create business with social value in targeting and serving rural people from poorer communities. We offer a customized, cost-efficient, and sustainable solution to meet their needs. More than seven years working with local communities, studying, monitoring, and listening to their problems and challenges, enabled us to develop our ceramic water filter, which is an environmentally friendly product that helps and addresses many social, economic, and environmental issues.

CHALLENGES FACED DURING THE PANDEMIC AND EFFORTS TO MITIGATE THEM

Before the COVID-19 crisis, we were in the manufacturing phase. The COVID-19 travel restrictions reduced our ability to build awareness and empower rural communities. We are trying to develop new techniques to continue investing in and empowering them through safe channels.

In response to the crisis, we changed our strategy to reduce our cash flow. We also focused our resources on online marketing instead of offline distribution.

With the outbreak of COVID-19, Water Will, in collaboration with the Life from Water Foundation, embarked on an awareness campaign to teach local communities about the importance of sterilization and good hygiene to reduce their risk of infection.

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KAZE Green Economy: KABIOF Team

WWW.KAZEGREENECONOMY.COM

TEAM
MEMBERS
(BURUNDI)

Yves Itangivyiza,
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OVERVIEW

Burundi depends largely on wood for its cooking energy needs. This situation causes an annual forest cover loss of 5,236–6,980 hectares. At this rate, Burundi's forest cover could disappear in 25–33 years, accelerating the impacts of climate change and making cooking energy less accessible as wood becomes scarce.

Globally, 2.8 billion people lack access to clean cooking energy and technologies; they rely primarily on inefficient and polluting cooking systems. Sub-Saharan Africa is among the regions with the highest number of people without access to clean fuels for cooking. Indoor pollution from the use of wood fuels poses a serious health threat.

Since 2017, our team has conducted applied research to create eco-friendly briquettes produced from organic solid household wastes and agricultural residues as raw materials. We market our products under the brand name KABIOF. Thanks to support from the Burundi Ministry of Hydraulic, Mining and Energy as well as UNDP Burundi, we have increased our production capacity, allowing us to reach more people with our products and achieve greater impact.

WHAT IS THE PROBLEM?

Wood is the main source of cooking energy in Burundi. Used as charcoal or firewood, it represents 95 percent of Burundi's energy consumption. As a result, the rate of deforestation in the country is alarming.

The use of charcoal or firewood for cooking also poses a health risk. The smoke produced by wood fuel exposes users, especially women and children, to respiratory diseases, which may increase their vulnerability to COVID-19.

Waste management is another challenge, especially in the large cities of Bujumbura and Gitega, where waste is piled up in illegal dumps. Improperly disposed of waste poses a serious health threat and increases greenhouse gases emissions, which accelerates the effects of climate change.

OUR SOLUTION

We produce two types of briquettes, KABIOF Rukwi for firewood substitution and KABIOF Makara for wood charcoal substitution. We also produce improved cook stoves made from recycled plastic and metal waste to increase energy efficiency and user safety.

In 2017, as a student in the faculty of Environmental Sciences at the Polytechnic University of Gitega, Delphin Kaze, our CEO, initiated research on waste in order to find an efficient and clean cooking energy solution. He conceived a prototype of eco-friendly briquettes made from agricultural residues and organic solid waste that we now market under the brand name KABIOF.

Our process works like this:

1. We work with local farmers and waste-collecting organizations to sustain an efficient raw material supply chain.
2. The waste is brought to the plant for treatment.
3. At the factory, we sort, dry, subject to pyrolysis, grind, and compact the waste.

4. We produce two types of KABIOF: KABIOF Rukwi and KABIOF Makara. KABIOF Makara is an eco-friendly charcoal briquette produced from the pyrolysis of biomass. It is made mainly from corn cobs. It is designed to replace wood charcoal and be used for cooking in households, restaurants, and hotels. KABIOF Rukwi is an eco-friendly briquette produced by pressing biomass. It is made from rice husks. It is designed to replace firewood for cooking or heating at military camps, boarding schools, and factories.

KABIOF has a longer burning time than wood or charcoal, it does not produce smoke, and it is an efficient source of power. These factors make KABIOF a credible alternative in the cooking energy sector.



KABIOF team members showcasing our products.

IMPLEMENTATION

Since the beginning of the project, in 2017, we have built strong partnerships with research institutions, especially the Université Polytechnique de Gitega. We aimed to develop efficient products for ever-increasing demand in new sustainable energy solutions. We are implementing the project in the cities of Gitega and Bujumbura in Burundi, where energy demand increases daily. We are providing enough KABIOF Makara and KABIOF Rukwi to reach 8,000 households with about five or six members each. We work with local farmer cooperatives and waste-collecting organizations to ensure a sustainable supply of raw materials. We partner with public and private institutions to promote the protection of the environment and advocate for the energy transition in Burundi.

TARGET MARKET

For KABIOF Makara, we target the urban and peri-urban population using charcoal as cooking energy. For KABIOF Rukwi, we target restaurants and hotels; institutions such as prisons, military camps, and boarding schools; and factories that use firewood.

PARTNERS

KAZE Green Economy benefits from the technical, administrative, and financial assistance partnerships in order to achieve greater impact (table 7.1).

Table 7.1 Partners working with KAZE Green Economy

PARTNER	NATURE OF PARTNERSHIP
Ministry of Higher Education and Scientific Research	Technical and administrative assistance in research and innovation
Ministry of Hydraulics, Mines and Energy	Technical and administrative assistance to implement our clean cooking energy solutions. This ministry is our main partner for policy advocacy.
UNDP Burundi	Technical and financial assistance
Université Polytechnique de Gitega, Faculty of Environmental Sciences	Research partner
Commune de Gitega	Policy advocacy
Gitega Technical Sanitation Service (SETAG)	Technical and administrative assistance in waste management
Waste-collecting organizations	Facilitates supply of raw materials
Farmers cooperatives	Facilitates supply of raw materials
Burundian Investment Promotion Authority (API)	Promotion and visibility of our project
Burundi Business Incubator(BBIN), Buja Hub, Spears Connect	Business coaching

PROGRESS TO DATE

After conceiving the prototype, in 2017, we produced 10 kilograms of KABIOF briquettes a day. In 2018, after recruiting three employees, we produced 40 kilograms a day. In 2019, we manufactured a small machine to help us increase our production to 300–500 kilograms a day. We now employ 42 people.

Thanks to the support of UNDP Burundi, we were able to set up a production plant with modern technology for transforming organic waste into the two types of eco-friendly briquettes. Production capacity is now at eight tons a day for KABIOF Makara, and 20 tons a day for KABIOF Rukwi.

In October 2020, we launched production activities in Bujumbura. Because of the COVID-19 pandemic, we produced only 208 tons of KABIOF in February 2021 (by recycling 290 tons of biodegradable waste). If not for the challenges caused by the pandemic, we could have produced 2,880 tons of KABIOF by recycling 4,080 tons of waste.

IMPACT

Our project has a significant socioeconomic and environmental impact. We are contributing to the achievement of several SDGs, including but not limited to SDG7 (on affordable and clean energy), SDG8 (on decent work and economic growth), and SDG13 (on climate action).

We are also contributing to the achievement of strategic objective No. 1 of Burundi's National Development Plan to preserve and restore land, fight desertification, and promote resilient development in the face of adverse impacts of climate change. We aim to develop a dynamic, diversified and competitive energy industry at regional and international level, and we aim to promote decent work and youth empowerment. In addition, we are helping Burundi to realize its commitments to reduce greenhouse gas emissions and meet Paris Agreement targets.

SCALABILITY

The KABIOF project has high growth potential. In a period of three years, we moved from production of 10 kilograms to 20 tons of briquettes a day. This production capacity now allows us to reach 8,000 households daily. As most people in Burundi and East Africa still depend on wood as the main source of energy, demand for cooking energy increases every day. We still have a lot to do to meet the market demand, which is also a huge opportunity. With availability of raw materials, our focus is now on increasing production capacity and implementing an efficient strategy to scale our products.

Another factor that facilitates scaling is that the government of Burundi is promoting clean cooking energy, environmental protection, and deforestation reduction among its priorities. In addition to KABIOF Makara and KABIOF Rukwi, we want to diversify our clean cooking energy solutions to reach all layers of society. We are planning to introduce cooking gas (liquefied petroleum gas) in urban areas and biogas in rural areas. All these solutions will strengthen our ability to provide access to clean cooking energy.

COMPETITOR ANALYSIS

Our competitors include wood charcoal distributors, gas suppliers, and briquette manufacturers. Wood charcoal distributors have an advantage, because they have produced an established product for a long time. Their major weakness is that charcoal is a major

source of environmental destruction, threatening in particular Burundi's forest cover. These fuels are also becoming more expensive and inaccessible as wood becomes scarcer and scarcer.

For gas suppliers, lack of proper communication has resulted in the perception of gas as an expensive and risky product.

Several companies produce briquettes. Lack of research and communication are barriers to mass adoption of their products.

Our skilled team and efficient marketing strategies ensure the high standards of our products, which will push more people to use KABIOF.

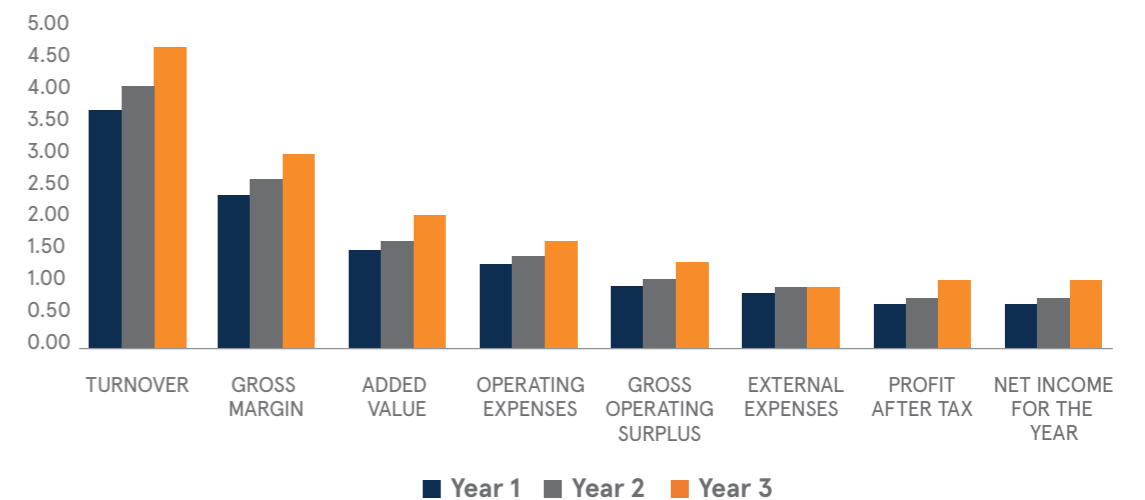
FINANCIAL PROJECTION OVER THE NEXT THREE YEARS

Over the next three years, we project turnover of FBu 3.754 billion, FBu 4.129 billion, and FBu 4.748 (figure 7.1).

The "self-financing capacity" (the company's capacity to meet its financial needs) is 25 percent the first year and 29 percent the second and third years. These figures are impressive for a company that is less than five years old.

KAGE predicts that it will no longer have a cash flow problem if the forecasts are realized.

Figure 7.1 Financial forecasts for KAGE over next three years (billions of FBu)



AWARDS AND RECOGNITION

Our work has received several awards and recognition from different institutions. We won second prize in the competition "Innovative Projects with Scientific Contributions," organized by the Ministry of Higher Education and Scientific Research. We were named best project in the fifth edition of the "Bankable Business Plan Competition," organized by the Burundi Investment Promotion Authority. We were selected as an innovative youth-led project to be promoted by the Youth Sustainable Energy Hub, a new initiative aimed at achieving SDG7, launched by the SDG7 Youth Constituency, in partnership with Sustainable Energy for All, UNIDO, UNICEF, SDSN Youth, IEES Power & Energy Society, and Climate Trackers.



“Our skilled team and efficient marketing strategies ensure the high standards of our products.”
- Delphin Kaze

