

KICK STUNTING OUT OF KASESE!

Our community-inspired battle cry to invest in nutrition for extremely poor mountainous children launched ICT/Drone-Enhanced Food Systems

GLOBALRISE | John Casillas | May 29, 2020

Come along with me to a forgotten Place; a tragical land of deep sorrow, of hungry orphans fighting rains and grueling heat, running from wars and stepping over dead bodies in the dense mountain jungles. With stomachs so big and eyes so heavy...they don't even realize their little organs are malforming. They know nothing of stunting but what they do know is that they don't have shoes or clothes that fit, and that it really doesn't matter because their hearts are torn as fathers fought mothers, many dying, leaving them to sleep on dirt staring up at the big bright moon above the mountains. Yet being so close to Mother Earth helped new ideas grow; ideas that changed everything. This is the story of how our Vision changed our Place.

Uganda National Anthem, 3rd verse

O Yuganda!
Ensi etuliisa,
Lw'omusana n'obugimu bw'ettaka,
Lw'obugazi bw'ensi yaffe,
Tujja kuyimirira bulijjo,
Ekimasa ky'amakula ga Afrika
(Luganda)

Oh Uganda!
The land that Feeds us,
By sun and fertile soil grown,
For our own dear land,
We'll always stand,
The Pearl of Africa's Crown!

It's 2050 and crisp loud voices unite, swelling ever higher to reach **Ekimasa ky'amakula ga Afrika** (the Pearl of Africa's Crown)! Rampant stunting defined our Place three decades ago when half of our children were sickⁱ but sweeping changes to our Food System transformed the way we live, eat and drink. Mountain schools and clinics sprung up, buoyed by over one million new paying farmers. Our children now stand healthy and proud!

But...it wasn't always this way.

Pushed to change by pandemics, war and violent weatherⁱⁱ, we harnessed the power of technology to support a new way of life. New solar-powered satellite dronesⁱⁱⁱ and mid-range satellite broadband systems^{iv} roaming the skies and 5G+^v gave us robust, reliable broadband. Using our equatorial Sun we farm solar power, taking advantage of Kasese’s Renewable Energy Strategy^{vi} to mainstream gender equity and renewable energy technologies,^{vii} to operate our “food systems within systems.” And we use solid state batteries^{viii} that do not emit carbon and last for months.^{ix}

^x At the nexus of food, technology and energy, our Food System has anchored our transformational journey from extremely poor to an economically empowered People.

Our school system radically changed curriculum with the waves of pandemics, mixing high value local and global teaching. Focusing investment on human capital, our government accelerated online learning^{xi} assisted by the African Development Bank^{xii} for Uganda’s population bulge^{xiii} of 100 million people, recognized as a formidable asset among the nations of the world.¹ Storytellers from the Culture Center at Rwenzori Founders, mentored by the International Storytelling Center in Tennessee, share the culture of our People. They tell us about planting trees during *Mulungi Mbwansi*, our community work tradition that was reborn into social exercise; and plants that can be used for medicine and not just food, and why its so important to take care of our lands. Appreciation for environmental literacy has spawned new mountain-based ecological studies that some are pursuing with advanced degrees.² For the first time, our children are competing globally with home-grown ideas that can change our world!

Roads will never reach our farms in the Rwenzoris (325 households and ~1.6 million people by 2050); its just *way* too steep and the heavy rains just wipes away what we have. A labyrinth of walking paths around boulders, rivers and steep hills meander like spider webs around our new brick homes. Responding to global calls to re-envision our energy and food systems, University professors and politicians began to focus on green economics^{xiv} and social ROIs to define sustainability while strengthening the local economy. It’s radically changed the way we value our mountains, rivers, trees and soil and moved us away from fossil fuel-intense factories that other nations have used to build their economies.

Some say its risky, even reckless to take this green path! Sub-saharan Africa has more low skilled, low paid workers than anywhere on the Planet by far – 789 million strong! But we opted not to

¹ Uganda’s population is projected to grow exponentially, from 40 million in 2015 to 141.2 million by 2065 driven by the high fertility rate. Youth in the age group 15-34 years will increase from 22.7 million in 2015 to 48 million by 2065. Briefing Note: African Institute for Development Policy

² <https://www.ecowatch.com/international-mountain-day-2018-2623054039.html> UN indicates mountains are often forgotten in 2030 Sustainable Development Goals. We envision our development effort will be studied in terms of impact to our People and our Place; hopefully benefiting other extremely poor mountain farmers.

use the Kasese Industrial Zone beside the new international airport for factories and this has angered some government officials all the way up to the African Union who think we should become a Global Factory^{xv}, replacing Taiwan and China. But our Food System helped us to understand how to survive and take care of Mother Earth at the same time, so foundational to Rwenzori Culture.^{xvi} The tense back and forth with politicians and trying to build novel green sustainable models using drones that strengthen our Food System has birthed an awakening for our People; a Green Society^{xvii} ³ that embraces a *new rurality*; agri-specialization, rural-urban linkages, investment in new markets and gender inclusive, green growth, halting natural resource depletion while lifting incomes. The pains of birth were sharp and still require political courage, often demonstrated at Policy Road Map⁴ meetings at Kasese Better Living Center (KBLC)⁵ where different views from farmers, businesses and others are presented, helping to make policy development far more gender inclusive!

For example, the intensity and frequency of storms in our Place opened floodgates of debate on weak polices governing watersheds. We lost neighbors and friends in May 2020; an entire family was washed down the river! (True story and very sad) Clearly, our culture requires **policy with public debate** to restore water banks, helping farmers to grasp magnitude of climate risk, necessity of compliance and promoting gender inclusiveness. Another area is jobs. Gender inclusive hiring is required within and across the Food System with weekly statistics reported to a University-based civic/civil/academic team that prepares and publishes online report cards using Africa Union's Gender Equity & Women's Empowerment ScoreCard.^{xviii}

KBLC promotes and evolves our Policy Road Map with diverse stakeholders including government, university, commerce, consumers/farmers and others. It's a living document that is continuously revisited as our neighbors in the Eastern African Community and African Union launch policies impacting our area. Weekly briefings rotate policymakers from Kampala, Kigali, Arusha, Nairobi, Kinshasa, Juba and international groups from China, Russia, USAID/Department of Commerce, Israel, India, Brazil and others, along with global food companies like Kelloggs that provide the pulse of global food chains, green successes and failures and new markets. A policy analysis unit of the Food System reduces all this info into profiles that inform Policy Road Map convenings. We

³ [http://www.unrisd.org/80256B3C005BCCF9/\(httpAuxPages\)/0F0B5009A146EC7DC1257A090043BB68/\\$file/Rio%20Mag%20\(small\).pdf](http://www.unrisd.org/80256B3C005BCCF9/(httpAuxPages)/0F0B5009A146EC7DC1257A090043BB68/$file/Rio%20Mag%20(small).pdf) An inclusive green society is the dynamic we are striving for in the Rwenzoris.

⁴ A Policy Road Map is being proposed to evolve the Food System in our Place and as its used, we envision it to become embedded for policy development and feedback in our Place.

⁵ Kasese Better Living Center is currently operational in Kasese however it is only partially and architecture plans call for another building. It's primary investor is Yosweri Museveni, President of Uganda. It is owned by the Rwenzori Field of Seventh-day Adventists. It is ideally positioned for Food Systems offices/governance.

leveraged our “policy engine” into a competitive green advantage, respecting our beloved mountains, lakes, rivers while building ecosystem value.

Governance structures for the Rwenzori Food System are based at KBLC but have many influential external inputs. Our principles are continuously refined by professors at the University’s Good Governance Institute with its long-standing tradition of hosting peace meetings for the many tribes in the region. With 56 tribes and 9 indigenous communities that are formally recognized in Uganda’s constitution, keeping peace isn’t always easy!^{xix} The Institute also specializes in e-governance and has been placed in charge of open, public meetings and assemblies like the Policy Road Map at KBLC. Communications are developed and sent to the radio station in KBLC to continuously inform mountain villagers of ongoing issues. Grievances are managed through third party negotiations and when necessary, a strengthened judicial system is used that has evolved in concert with iterations of Uganda’s National Development Plan.^{xx}

KBLC also convenes a Global Development Conference for scientists, civic/business leaders, others exploring our journey from malnutrition and poverty to empowerment using the Food System. Proceedings are published and best practices documented so mountain areas of the world can benefit from our experience. The Food System also opened up an advisory arm to assist other countries to build holistic drone food systems in an earnest quest to save desperately needed mountain ecosystems.⁶

Our quest to save our Place began when Kasese District decided to invest in a drone prototype developed in Kirembe, a small subvillage that is home to BioGardens. It gradually expanded service to high peaks and plateaus after automation of the local Village Savings Group enabled as a **pay-as-you-go community utility, accessible by phone**, just like home electricity in Kasese...its item number 7 on the list of services above sending money! The drone transportation system began by linking household produce from a few test households to the Kasese Food Market. At first, groups of Bukonzo gathered to watch, pointing up at the air and laughing! But when the first families started to earn money and told neighbors, the town supervisors took notice and went to BioGardens, where we based the first test flights, to know when their families can onboard.⁷

⁶ <http://www.fao.org/fao-stories/article/en/c/1070101/> #MountainsMatter is a compelling initiative of the FAO socializing a critical need to save mountains and mountain peoples before its too late.

⁷ Community/village pilots in the mountains must be carefully choreographed. We must make sure that systems are working and safe and during this time, some of the community leadership will become impatient (we’ve already experienced this). To address this, we work with BioGardens to create and publish a schedule of meetings for one year so that everyone is on the same page. Government members have promised attendance, including the Mayor, to show support. This little management technique works wonders!

As farmers successfully sold their produce and improved household finances, it ignited and began to spread to the Karobole, Fort Portal and Bundibugyo Districts. North Kivu in the DRC came last mostly because of politics in Kinshasa, the capital, and also due to rebel groups in the DRC side of the Rwenzori Mountains;^{xxi} but even they began to rely on this incredibly efficient transportation system to improve their household finances.⁸

Soon the drone system was opening a door to a compelling mountain marketplace as more joined (classic network effects^{xxii}). Each progression, however, was moderated with the time it takes to automate Village Savings Groups^{xxiii}, about 6 months, but soon a new Association of Village Savings Groups (AVSG), encouraged by government policy and working within the regulatory framework of Uganda for financial institutions^{xxiv}, was organized at Rwenzori International University. The association works hand in hand with KBLC's Village Training Networks across 450+ mountain churches and other village centers, organizing the orderly village-by-village onboarding onto our drone system. AVSG takes on training of savings groups, helping to implement fintech platforms that enable cashless banking across our system via mobile phone. When broadband finally reached the Rwenzoris via the Amos-17 satellite and others around 2030, it accelerated micro-banking in our villages.^{xxv xxvi} With end-to-end automation of financial transactions across our Food System, agri-crowdfunding took off, partnering people and companies all over the world with mountain farmers/farmer coops.

Our People are managing newly found health/wealth in an automated way, from cashless transactions to routine doctor visits...amazing but this is not the first time tech has leapfrogged traditional systems in Africa. Mobile money launched in Kenya had 400 million users in Sub-Saharan Africa (as of 2018; much more by 2050) and helps farmers to better manage micro-enterprises.^{xxvii} Our People use their phones for just about everything. As Village med-kiosks sprouted up throughout the mountains, originally prototyped in Kenya by Access Afya,^{xxviii} for tele-health consultations, cervical examinations and other diagnostic procedures, it took all day (or days) to walk down to the town and wait at hospitals, but now texts help to manage the health of children at home or when necessary at kiosks, clinics or hospitals. Most of the paper is gone; just about everything is done by phone and recorded in mbPHRs. Freeing up valuable time helps with myriad daily tasks including mostly, household farming (i.e., people-centered systems).

Our Food System is enhanced with autonomous drones, swarming around "drone beehives", that systemically respond to thousands of incoming requests from farms high in the mountains to fill orders from diverse food stakeholders (consumers, processors, distributors, institutional buyers) creating a dynamic, demand-based food ecosystem. The transport packages comply with rigorous

⁸ For many reasons, our mostly Bukonzo Team believe this is inevitable because they routinely go into town to buy food for troops in their camps/bases.

safety/quality standards using World Economic Forum's Performance-based Regulations⁹ zooming along licensed flight ways. They retrieve and deliver containers with extremely low noise output.^{xxix xxx}

Embedded sensors are integrated into the intelligence and navigation systems, confirming and continuously recording quality, weight and other variables prior to drone lift off points that are fitted on household silos used to reduce food waste from ~40% today^{xxxi} to <10% by 2050. The platform itself drives new intelligence for the ecosystem. Like Uber, farmers and mountain farmer coops can instantly respond to market demands from wholesalers (middle buyers selling at the farmer's market, others), retailers and even consumers ordering fresh vegetables from home.

Perhaps one the most striking things about our Food System is our green warehouse or so called Drone Beehive.¹⁰ The many thousands of flights coming in and out mimic a swarm of bees! It's a place for building, docking, storing, testing, multi-level loading and much more. Engineers, IT/Network experts, pilots, warehouse works, food technicians cooperatively keep it humming! The structure housing the drones is highly specialized to optimize efficiency of people, trucks, drones, containers, food-related processing and/or storage and much more.

Our policy now officially recognizes that drones are elements of transportation and like roads, can launch diverse mountainous investments. Since government can't build roads to our homes, one of four deep development issues per our Mayor, drone transport has become a *principle of public equity*, dramatically shifting perception of public investments for one million extremely poor Bukonzo in the mountains. Budgets, supplemented with private investment (PPP), were implemented that included tax deferrals to steer private investment along areas of need – energy systems, refrigeration, Intel systems, drone infrastructure and more. Patent protection is rigorously enforced encouraging next gen food visionaries to pitch in and help!

The drone-enhanced system forms a backbone of our Vision however the other parts make it an extraordinary community transformation agent; thus to access it, farmers must: (1) link village savings accounts to phones and activate a unique digital ID; (2) participate in community nutrition training that includes baby monitoring, evolves community trainers and leaders and is staffed with university interns in nutrition, agronomy, public health and civic leaders; and, (3) attend training meetings that help with government-required containers, household and village silos, and continuously learn about local farming issues, platform updates, text alerts and more.

⁹ <https://www.weforum.org/projects/new-paradigms-for-drone-regulation>

¹⁰ <https://money.cnn.com/2017/06/23/technology/amazon-drone-beehives/index.html>

As Villagers begin to use their new Food System, change occurs gradually and then moves rapidly, unleashing a miracle in the mountains! By 2050, the new platform is onboarding private firms using standardized APIs who compete across products and services in a thriving \$100 million mountain economy. They offer goods and services like accredited organic fertilizers, drone spraying, land surveying, crop mapping, large capacity drones for farmer's coops or household collectives, refrigerated drones linked to aquaculture and more.

Uganda's entrepreneurial women farmers,¹¹ placing first on a global index of women business owners developed by MasterCard, (suggesting gender equity is game on in Uganda), form groups to specialize across a wide variety of foods. Micro-enterprises are proliferating like buying Spirulina from new drone-enhanced Great Lake markets (Lakes Albert, George and Edward), processing it into powder to enrich Bundu and selling to some 8 million Bukonzo in Uganda and DRC (growing from ~6 million in 2020, Uganda has one of the highest fertility rates in the world; the border is considered quite porous with Bukonzo going back and forth).^{xxxii}

Jack Fruit trees, formerly a dime a dozen in our Place, have captured world diet intrigue and the velvety, pearish tasting fruit that can mimic meat is in high demand, including the seeds that are ground for flour and the skin that is rinsed to make juice. Market makers at KBLC connect with global value chains. To meet demand, mountain farmers and micro-enterprise owners form new coops, supplying Jack Fruit to processing centers at Kasese's growing Green Industrial Zone near the Kasese International Airport.^{xxxiii} It received a boost from Uganda's Airport Authority selection as a key airway corridor due to the many nearby national parks that fuel tourism (Queen Elizabeth National Park, Rwenzori Mountain National Park, Semuliki National Park, Kibale Forest National Park, others). "Flying trucks" pioneered by Boeing^{xxxiv} carrying 500 pounds, and other new large capacity drone entrants, are linking mountain coops to the rich supply of Jack Fruit in the mountains. The coops use PPP-funded and built green warehouses in the mountains that offer government regulated quality inspections using new biodegradable optical sensors^{xxxv} to capture quality, volume; they send metrics to Cloud/AI fueling dashboards that help to monitor value chain optimization.^{xxxvi}

The Village Training Network's 450+ mountain churches and other centers take primary responsibility for food waste, rotating field teams that take rejected fruit and use innovations like Sparky Dryers^{xxxvii xxxviii} and/or placing it into "charitable drone zones" for pick up and distribution to individual households who are flagged by social services. With bank-driven digital identity

¹¹ <https://newsroom.mastercard.com/wp-content/uploads/2019/11/Mastercard-Index-of-Women-Entrepreneurs-2019.pdf> See page 13: Mastercard Index finds Uganda's women placed #1 % of business owners globally; finds gender equity is improving in Uganda.

protocols used across systems, we can securely and efficiently manage social interventions using technology.

New information technology services are integrated into the drone system for weather forecasting from local to global groups, predicting lightning strikes¹², elephant drone surveillance and more...texted to farmers. Farmers love their lands but it gets a little difficult when a herd of elephants decide to cross, nibbling on maize as they go (something we've witnessed more than once now)! Government provides basic services while private sector value-added data services proliferate, scaling digital agriculture in the mountains.

Opening air space in National Parks is required to permit drone flight with routinely updated specifications: type, range of drones, cargo weights, compliance and reporting with enforced penalties that encourage discipline in use and development. Linking IT systems is prioritized across our Food System so data flows. Government has stepped in with data standards and wireless protocol that, with 5G and IoT, drives seamless connections. This enables mountain-adapted precision farming tools like animal sensors signaling phones to keep track of goats to specialized agri-bots that farm fields of Matooke and coffee, especially in the corridors in between the plants, maintaining cover crops whose root systems stabilize the soil during heavy rains.

Meals in Sub-Saharan Africa dramatically skew towards carbs, far more than anywhere in the world.^{xxxix} Our rich food traditions sadly overuse bundu and matooke to create ***a resilient, un nourishing system of stunting***. In fact GlobalRise's 2019/2020 Survey reveals local plate composition to be 85% carbs, 11.5% proteins and 3.5% fats...this must change to 65% carbs, 15% protein and 20% fats. Shifting to less, higher quality carbs is vital thus staples remain but fruits and vegetables are added to increase vitamins, minerals, fiber and antioxidants. Low protein diets bring amino acid deficiency, directly affecting cell growth and immunity and enabling metabolic disease like marasmus and kwashiorkor^{xl}. As animal protein is expensive, plant-based protein is used, like soy, red and black beans, peas and peanuts that are culturally acceptable and fit budget. Fish, milk, insects and eggs, cheaper than chicken, beef or pork, have high biological value so work great! Maize and cassava, no longer harboring poisonous aflatoxins because of the way we are storing and processing them, are our primary carbs along with matooke (plantain).

Animal proteins from goat and chicken are scarce, as well as fish...until we developed drone-to-aquaculture markets. So we amplified plant-based protein from beans, peanuts, cereals and roots, grown a lot in our Place. Plant-based protein, a strong global trend for reasons of health and environment, is a natural fit for our community strategy to mimic Blue Zones. Women farmers *totally* clamor for knowledge, longing to improve the health of their babies. Diets are

¹²<https://aclenet.org/programs/detecting-lightning-strikes/worldwide-lightning-detection---gld360.html>

embraced clearing a pathway to end malnutrition! But to be very clear, this pathway is based on evidence.

As women onboard the Food System they are required to have family members examined, especially babies through first 1,000 days filter^{xlii}. For those requiring it, 3D printed indigenous RUTFs are produced at KBLC/private labs containing edible optical nanotechnology sensors, engineered from *Bombyx mori* silkworms, developed at Tufts University School of Engineering.¹³ These long living ingestible and biodegradable sensors,¹⁴ dissolved on demand, have optical signals that are recorded on mbPHRs, tracking vital biological functions around malnourishment – levels of blood glucose indicating metabolics, iron (anemia), zinc (brain function), essential amino acids (cell structure), Vitamin A (sight) and more, forming a closed digital loop. Linked to clinical decision support engines developed by academic health centers, mbPHRs alert clinicians with any imbalance or abnormality and, when approved, text Mothers for follow-up. These digital feedback loops help clinicians to proactively monitor the health of babies and for malnourished pregnant women, using different “medicinal food”, they help to treat and prevent malnutrition in the womb.

Housing and sanitation, another factor in malnourishment, has also transformed in our Place as incomes rose. Safer brick homes with eco-friendly materials, securing/building water wells and Loowatt^{xliii} toilet systems that convert waste to fertilizer^{xliiii} and other household improvements has unleashed thousands of construction jobs. In fact, construction supply value chains have applied to rent space in our Drone Beehives to distribute building supplies in the mountains. Due to intensity of investment other verticals seek to use the Beehive, which is modularized to allow for expansion using the same command center; proving additional revenues to our System.

One household item that is stocked are silos that reduce household food waste by 60%^{xliv} and are used for drone operations (landing and pick up). There are however many other landing/pick-up zones used by coops, food processors, at the farmer’s market and more. All integrate seamlessly w/drone sensors to measure weight of cargo, size of vegetables, identify ripe, unripe, damaged, etc., reducing needless flights.

Our market makers have also opened a few key exciting markets: world class safari resorts, refugee camps and aquaculture.

¹³ <https://www.nanowerk.com/news/newsid=6667.php>

¹⁴ These same sensors, tiny data-emitting wonders, are also used throughout the Food System collecting quality data; integrated with drones to sense quality of produce prior to transport. Sensors combined with 5G and IoT are helping us to manage our Food System.

One of the safaris resorts in Queen Elizabeth National Park, Kasenyi Safari Camp, send cars out for fresh fruit and vegetables 5+ times a week during tourism season and even then, it always seems like they are out of something! Drones link safaris to myriad food markets located throughout the Rwenzori, including mountain farmers; enabling kitchen staff to order online and track orders until they reach destination. A new Rwenzori branding program lets resort tourists know that when they eat they are helping to lift extremely poor out of poverty.^{xlv} The program is promoted by the Kasese Tourism Association that has been established to, among other things, preserve the environment that they love and protect livelihood. The program is also used by Rwenzori Mountaineering Services to guide thousands of visitors into the amazingly lush, other-worldly environment of our mountains. Like many mountainous regions, tourism is a critical part of our economy and offers a robust opportunity to advance the economics of our Place.

Uganda, with its liberal refugee policies, is the third largest refugee hosting country in the world with over 1.2 million (in 2020).^{xlvi} Many stay with farming land provided by the government to build a new life away from war. They live in 11 designated camps mostly in north Uganda, two located near the border with Rwanda, Nakivale and Kyaka camps, are linked to our Food System. Importantly, Uganda hosts the largest number of unaccompanied child refugees in the world, about 41,200 in 2018, most from South Sudan. Bidi Bidi is the largest refugee camp in the world^{xlvii} and has transformed into a city in its own right.^{xlviii} The refugee settlements and camps provide a strong market for our People and they understand them; a number of the orphans in our hills come from the refugee camps, many traveling alone through dense forests, stepping over dead bodies to arrive here from South Sudan. Receiving guidance from UN surveillance drones, Uganda's National Police and regional coordination helps to anticipate and plan for potential interruptions of Food System operations from rebels in the mountains. Our business analysts use situational reports in South Sudan, DRC and Burundi to size refugee populations and potential food markets.

Nearby in Lakes Edward and George, refrigerated drones originally developed at Johns Hopkins Medicine^{xliv}, are moving fish and Spirulina from aqua-farms to the mountains. Already deeply tied to food traditions with Bundu, a cassava paste with low nutritive value, Spirulina has been integrated in diets, developed at KBLC Food Labs, and with government social credits, are being widely used by mothers and babies, making a profound difference in health. Radio promotions designed with teams of local nutritionists, agronomists, policy makers, PR experts and musicians have created a series of catchy radio and social media messages that went viral, lifting sorely needed awareness around diet.

Village Training has emerged as a central way of life for our People, offering bi-directional value for saving culture and tradition. Use of church-based facilities enable tight organization and scale with trusted community stakeholders. Trainers teach nutrition like breast and complimentary

feeding, agronomy, policy, new markets while villagers bring thousands of stories about indigenous food preparations, cultural practices, beliefs and traditions, all faithfully recorded (written and video) by University interns from the Arts & Humanities Department at Rwenzori International University. The information is shared with a Culture Center at Rwenzori Founders, where Uganda's leading artists create stunning visual displays that celebrate Rwenzori culture; competing at the annual Rwenzori Storytelling Festival where the community is invited to hear stories told with amazing skill, mentored by the International Storytelling Center¹⁵ that has honed storytelling for peace and humanity.

Winning displays, selected by the audience, are exhibited at the Great African Museum in Algeria, a flagship project of the African Union's 2063 Vision, that has strengthened African identity by saving the colorful vibes, rhythms, foods and traditions of African life and culture. Saving cultural traditions – stories, food preparations, artifacts, dances – has become highly valued; for these tell the stories of our identity as a People.

Village training teams meet periodically to review priorities and scheduling that is circulated throughout our food system, activating paid/volunteer/intern groups to participate, design and build training materials, organize logistics, etc. Each training topic is choreographed around subject matter, linguistics (up to 16 dialects), visuals, learning modality, tech-enablement and follow-up methodology. Metrics are continuously gathered, evaluated and inform ongoing training cycles. Certifiable results are independently gathered via drones (soil testing, imaging to grade sustainable land management practices), sanitation and irrigation protocols (imaging), and more.

Human results are also coming in from PHRs that every family member receives at onboarding. In fact, tethering drone systems activation with village savings accounts, phones and PHRs has accelerated adoption of our Food System, powerfully transforming trajectory of poor mountain farmers to resilient, healthy and productive lives; a major policy success.

IoT enables e-prescriptions using drones, recording in longitudinal mbPHRs that hold records from cradle to grave for our People. For public health this is extraordinary, delivering real time community health metrics showing transformation from sickness to vibrant health. As villages clamor to onboard the drone system to lift finances, mbPHR adoption soars enabling personalized healthcare. Mountain-specific treatment modalities emerge catalyzing the creation of a new regional medical center at Rwenzori Intern'l University's rural campus. Linking the transformation potential of phone banking, food use and commerce and automated health records provides a huge force multiplier for lifting our People to Uganda's 2040 middle income society.

¹⁵ <https://www.storytellingcenter.net/>

The Rwenzori Food System (RFS) is a centerpiece of policy and community transformation because of all the resources this Place offers, none match its scale of impact. It has become a vital green hub of economic activity approaching \$100 million annually; and has secured green investment zoning by the African Union, opening up global financing and bonds for food systems infrastructure that will keep us on track through 2100.

There are serious issues that we must address like soil fertility and erosion, although our new sustainable land management training at BioGardens is helping. Deforestation has declined as environmental literacy using community generated stories build cultural appreciation among the Bukonzo. Managing river bends is also a key challenge but *Mulungi Mbwansi* has become a popular social exercise and a tangible way to express appreciation for our beautiful lands! Our work on Mubuku River protects Kasese's Food Basket, the Mubuku Irrigation Scheme. We must also keep pace with digital agriculture policies being adopted by the African Union, and we need to keep policy focused on gender equity and developing Human Capital; it has served us well thus far.

In the global journey to reach Sustainable Development Goals, Earth's mountains have been forgotten.¹⁶ Reaching higher for humanity, FAO's #MountainsMatter screams from the summits; *this must stop!* These sacred majestic icons cover 27% of our Anthropocene, hosting 6 of the 20 vital crops that feed our species and giving fresh water that quenches the thirst of half of all humanity. Yet they harbor some of the poorest and hungriest among us, who are migrating to cities, forsaking untold storehouses of valuable, indigenous knowledge vital to everyone.

Our beloved Rwenzori Mountains of the Moon may not compete against fossil fuel economies, and we found out we just don't want to; but we know green ways that can help to save our species. By 2040, when our glaciers sadly melted away, laying bare Mount Stanley and Margherita Peak, rivers and rains angrily descended like mountain demons crushing our lands, destroying our farms and homes.

We fought back to save our sons and daughters.



Official Flag of Uganda

ⁱ<http://journals.uonbi.ac.ke/files/journals/1/articles/306/submission/copyedit/306-1094-1-CE.pdf>

ⁱⁱ<https://www.dw.com/en/extreme-weather-threatens-african-society-and-economy/a-45713490>

ⁱⁱⁱ <https://www.iflscience.com/technology/solar-powered-drone-could-fly-nonstop-five-years/>

¹⁶ United Nations

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- iv <https://www.cnbc.com/2019/12/14/spacex-oneweb-and-amazon-to-launch-thousands-more-satellites-in-2020s.html>
- v <https://africabusinesscommunities.com/tech/tech-news/zte-and-mtn-start-5g-network-trial-in-uganda/>
- vi https://d2ouvy59p0dg6k.cloudfront.net/downloads/kasese_district_renewable_energy_strategy.pdf
- vii https://d2ouvy59p0dg6k.cloudfront.net/downloads/kasese_district_renewable_energy_strategy.pdf
- viii <https://scitechdaily.com/new-li-ion-superconductor-enables-safe-high-performance-all-solid-state-batteries/>
- ix <https://dronelife.com/2019/03/20/technologies-transform-future-drone-operations/>
- x <https://www.pocket-lint.com/gadgets/news/130380-future-batteries-coming-soon-charge-in-seconds-last-months-and-power-over-the-air>
- xi <https://ugbusiness.com/3878/traditional-universities-are-on-the-way-out-online-is-the-future-for-africa>
- xii <https://www.universityworldnews.com/post.php?story=20200413083638806>
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