

Competition Code: 2003_GCRF_DEMO_IMPACT_P2

Total available funding is £1.8 million

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
KISPE LTD	Methane Emissions Monitoring Service for Central Asia	£5,880	£4,116
GHGSAT (UK) LIMITED		£0	£0
GHGSat Inc.		£79,834	£55,884

This discovery project focuses on market development for a service to monitor onshore industrial methane emissions in Central Asia, where greenhouse gas emissions present a significant environmental problem.

The service draws on public and commercial satellite measurements of greenhouse gases at different resolutions, with a heavy reliance on the commercial GHGSat data. This commercial data is critical for the service because it is the only commercial satellite data at a sufficient resolution for attributing emissions to specific industrial facilities.

The project builds on a peer-reviewed 2019 case study in which GHGSat demonstrated the capability for Central Asia. The purpose of this feasibility study is to engage the local stakeholders to build the market and to capture their specific service needs through a user centred design exercise.

Kispe Ltd is partnering with Montreal-based GHGSat Inc to deliver this project with a view to an expanded service prototype to be delivered by GHGSat (UK) Ltd. GHGSat Ltd is newly established in the UK and plans to deliver a range of services including development assistance services for environmental sustainability. The user centre design is essential for meeting unique user needs, the design exercise will be facilitated by the Satellite Applications design team.



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INNOVATION CONSULTANCY & ENTREPRENEURSHIP LTD	An Innovative Cold-storage Enabler & Digital (A-ICED) logistics platform	£52,514	£36,760
Alkebulan Agro-Allied Limited		£11,809	£8,266
AOX Logistics Limited		£21,366	£14,956

With the world's population expected to reach 9.7Bn by 2050, the numbers malnourished is expected to increase reaching 2Bn. Feeding the growing population requires 70% food production increase by 2050, however, a cost-effective method to bridge this should be ensuring that most food produced doesn't get spoiled between the farm-to-table.

The main causes of food loss/spoilage have been identified as:

- * Insufficient post-harvest and on-farm storage technologies;
- * Dated practices for handling, processing and packaging; and
- * Limited market information and access, decreasing farmers' abilities to sell products at a decent price before they spoil.

There is a need to minimise loss rate so that nutrient-rich foods critical for achieving healthy dietary diversity remains reasonably priced for the general population. A good starting point is simply addressing these causes of food loss/spoilage.

Our project team will develop/validate A-ICED, a fully integrated cold storage supply chain platform for poor to middle class population aimed at bridging the gap between food production and market security, mostly caused by poor post-harvest handling.

With A-ICED, we are providing a platform that will be readily available on both smart and ordinary phones providing information to both farmers and merchants to ensure profitability while nourishing the population.



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NANOSHIFT LTD	BioSan biomass feedstock for sustainable and cost-effective sanitary pads: a case study of rural areas in Pakistan	£61,398	£36,378
Brunel University London		£12,438	£12,438
Government of Khyber Pukhtoonkhwa		£1,086	£1,086
University of Agriculture Peshawar Pakistan		£10,078	£10,078

Women in rural Pakistan do not have access to hygienic, cost-effective and sustainable sanitary pads, which has detrimental effects on women's health and hinders their participation in education and employment. BioSan aims to develop low-cost, reusable pads using agricultural residues. We propose an innovative solution by up-cycling biomass feedstock using a cost-effective process to transform this into pure cellulose and functionalising it with nanoparticles to create a novel sustainable antimicrobial core for affordable sanitary pads that are hygienic, low-cost and re-usable. As the product has a strong socio-cultural connotation, we will employ a Human Centred Design approach to actively reach out and work closely with local women's groups to address their challenges. Specifically, the "Double Diamond design process" will be employed by exploring innovative ways to develop a sanitary solution through co-design, participatory methods and user feedback to ensure the needs of potential users are understood. The goal is to assess the potential to implement cost-effective manufacturing methods through low capital intervention in small local plants within communities using native secondary raw materials. The impact is to increase equality and access to education, employment opportunities and improve the quality of life for women in rural areas of Pakistan.

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GLYCONICS LIMITED	Market feasibility to explore development of a novel low-cost point-of-care diagnostic platform for diabetic screening in the Democratic Republic of Congo.	£85,183	£59,628

Diabetes is a major global challenge for which the vast majority (>90%) of cases have type-2 diabetes that is largely preventable/manageable through lifestyle interventions if caught early. Early detection is key to long-term management of the condition, enabling cost savings per patient and an increase in life-years.

Existing portable diagnostic techniques (urine dipstick; fingerstick blood glucose) are inconvenient/invasive, inaccurate & use single-use plastics, and thus not recommended.

Glyconics seeks to overcome this challenge using of a point-of-care diagnostics platform enabling rapid, low-cost, high-accuracy Patient screening, using clinically proven non-invasive infrared reflectance measurements of the Patient's fingernail.

The technique is quick, accessible and has the potential to significantly reduce the number false-positive referrals, delivering patient cost savings (compared to the gold-standard questionnaires).

The project will investigate the possibility of introducing the technology into ODA countries, with the Democratic Republic of Congo (DRC) being researched in this project. DRC has the 5th highest incidence of diabetes in Africa (WHO 2015) and it is a recognised problem within the country.

Market and clinical research, including patient measurements, clinical pathways, engagement with patient groups and health economics assessment.

The research will be conducted in collaboration with Université Catholique de Bukavu and Diabetes Africa.



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PROCTER & GAMBLE TECHNICAL CENTRES LIMITED	RESONATE - water reuse innovation for sustainable households, communities and cities	£69,182	£27,673
Indian Institute of Technology Gandhinagar, India		£9,000	£9,000
Newcastle University		£15,056	£15,056

RESONATE brings together P&G, Newcastle University and IIT Gandhinagar to address UN Sustainable Development Goal 6: Clean Water and Sanitation by creating affordable, domestic water saving solutions for consumers' home and personal cleaning needs in India, through novel water reuse devices and products. India has 18% of the world's population but only 4% of usable water sources. By 2030, water demand is expected to be twice available supply, with water stress projected to lead to 6% GDP loss. Water management legislation and infrastructure are essential but not sufficient to counteract increasing scarcity in regions such as Gujarat. Washing clothes is a major component of domestic water consumption and ripe for innovation to rapidly reduce demand, release scarce water for cooking, drinking and personal cleansing and enable more equitable access. Phase 1 combines human-centred design and technical feasibility of novel physical and chemical water treatments and recycling, sustainable behaviour adoption and resilient business models to realise the benefits of laundry water saving among middle and lower-income consumers. It will act as a demonstrator for how sources of domestic wastewater can be reused and will identify partners and key stakeholders needed to progress through Phase 2 and key metrics targeting SDG 6\.

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FAIR BUSINESS ALLIANCE LTD	Amazonian Vanilla Market Creation as an Enabler of Sustainable Development in Rural Ecuador	£59,962	£38,975
Aliados Foundation		£11,640	£7,566
University of Edinburgh		£13,415	£13,415

Trade and market access have proven to be key drivers of economic stability and poverty reduction globally. Yet, for many indigenous Kichwa farmers living in Amazonian Ecuador, significant barriers exist that prevent them from reaping the full benefits provided by trade and markets. Chronic poverty is still very present in these rural areas and deeply intertwined with environmental degradation of highly biodiverse ecosystems through large-scale resource extraction and unprofitable mono-crop agriculture. Especially women are disproportionately affected by poverty cycles in these traditionally male-dominated contexts and often excluded from economic development and social mobility.

This feasibility study introduces an inclusive approach for strengthening community resilience and rainforest conservation in rural Ecuador by exploring the creation of an Ecuadorian premium vanilla market with an active and participatory value chain integration of smallholder farmer cooperatives from Amazonian Kichwa communities. The study will assess the international market potential of the Amazonian type of the "Queen of Spices" and its possibility to be cultivated and commercialized through indigenous community enterprises. The objective is to generate a higher and more stable economic income for local communities, strengthen female indigenous leadership opportunities, protect endangered vanilla orchids, and facilitate new vanilla product developments in Ecuador and the UK.

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CLOUDSENSE CONSULTING LTD	Aqua-sense - Real-time, Cloud-based Clean Water Detection Monitoring & Early Alert solution	£76,469	£50,470
Brunel University London		£8,985	£8,985

Over 2.2 bn people globally have no access to clean and safe water. Current testing methods are reactive, offline and a combination of human /natural contamination causes leads to poor knowledge and delayed intervention causing every year over USD 7 bn loss to the global economy in deaths, diseases, and productivity loss.

Our proposed innovation uses next-generation technologies to allow citizens, Govt. and other stakeholders to detect, manage and alert **_safety, availability, and accessibility of clean water,_** **_in a real-time scenario_**, and make informed decisions that will transform lives. The innovation directly contributes to UN SDG Goals 6 & Goal 3\.

As part of the discovery phase, we have chosen a few rural targets sites in India and aim to understand the socio-economic implications of water issues in their daily lives, current measures, workaround, and stakeholders' involvement. we also aim to conduct a technical trial to test our techno-commercial assumptions around our solution design /usage, understand legal /governmental regulations around deployment.

Our project aims to make the solution not just technically feasible but affordable, appropriate and acceptable to users, keeping in view their attitudes and approach towards the adoption of innovation.



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RAZBIO LIMITED	Smart Monitoring and Control of the Dengue Vector	£66,191	£39,715
Muhammad Nawaz Shareef University of Agriculture, Multan, Pakistan		£14,496	£14,496
Swansea University		£7,143	£5,714

This study focuses on improving the monitoring and control of **_Aedes_** mosquitoes (_Aedes aegypti, Aedes albopictus_) which vector dengue. Over half the world's population is at risk of being infected with dengue with low income groups being particularly affected. In Pakistan, dengue outbreaks are regular and quite extensive, causing considerable hardships. For effective dengue management, participation and "buy in" from local communities is crucial.

As no effective vaccine against dengue is available, careful monitoring and control of the _Aedes_ mosquitoes is essential. Early detection, especially at low population densities, allows timely action to be taken to suppress pest numbers before they explode following heavy rains. This project will develop inexpensive traps using disposable soft drink bottles, new lures and a fungus which is effective in killing mosquito adults and larvae. These products can be used alone and in a "**Lure & Kill**" (L&K) strategy where gravid _Aedes_ are lured to a trap containing spores of the fungal pathogen. Workshops will provide the opportunity for all stakeholders to evaluate the products and L&K strategy. From this study, we will be able to develop more effective dengue vector management strategies going forward that are fit for purpose.

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CLEAN WATER DESIGNS LTD.	Innovative Low Cost Easy Access Medical Grade Water Purification Technology For Ghanaian Hospitals & Health Facilities	£64,753	£44,032
CHALLENGES WORLDWIDE LIMITED		£22,800	£15,960

Water is a versatile resource that is vital to human health. Although it has many uses in medical procedures and treatments, it can be difficult to obtain the correct quality and at the required quantities of water in some locations in the world. These limitations disadvantage African communities and can be attributed directly to the reduced quality of treatments women receive, leading to secondary infection and death.

Clean Water Designs has a mission to develop the technology to bring the highest quality water to where it's needed. In that pursuit, they have developed a patent pending technology that allows Medical Grade Water to be produced both energy and space efficiently, in greater quantities than the competition, and at reduced costs for medical facilities. Therefore, allowing this vital resource to be available on tap at hospitals and health clinics throughout Ghana.

In this partnership project, they will further develop their technology and produce a bespoke product for the Ghanaian medical facilities, taking into account the unique challenges and requirements, making it fit for purpose for both centralised hospitals and local health clinics.

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SEIP 7 TECHNOLOGY AND RESEARCH LTD	Sustainable engineering biology technologies for water decontamination	£73,152	£42,721
University of Birmingham		£17,257	£17,257

More than 2 billion people worldwide have no access to clean water because \>80% of wastewater returns to the environment untreated. Inefficient removal of contaminants from wastewater has critical consequences on down-stream water resources, as treated water represents a major component of river flows, irrigation and managed aquifer recharge. Inadequately managed water exposes individuals to health problems and death; it contributes to malnutrition, poverty, and disparities of wealth. In Brazil, 35 million people have no access to clean drinking water and 100 million do not have sewerage. State-of-the-art tertiary wastewater treatment has been proven inefficient, generates toxic by-products, and it is prohibitively expensive for low and middle-income countries.

We propose a horizon scan of the Brazilian market to commercialize a sustainable biotechnology for water decontamination invented by the technical lead (Daphne Water Solutions, DWS, patent GB1918129.6). The technology is a single solution to full regulatory compliance, sustainable, green, and scalable, enabling water reuse. DWS works as a microscopic 'vacuum cleaner' that absorbs, concentrates, and retains both suspended and dissolved contaminants from wastewater, with an efficiency up to 99%. Following the principle of circular economy, DWS converts the biowaste resulting from the decontamination process into clean water and harmless gasses.

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ENVIRONMENTAL MONITORING SOLUTIONS LIMITED	MANTIS - Monitoring and ANalytics To Improve Service	£60,269	£33,751
Leeds Beckett University		£25,703	£25,703

This project will explore the opportunities and challenges associated with the wider deployment of a 'proven' prototype hand pump monitor called MANTIS. The study will seek to further develop and deploy the MANTIS system and will consider the technological, societal, and market issues associated with its application to rural India. It is anticipated that this exercise will help cultivate more appropriate maintenance strategies for water points by integrating and responding to qualitative (human-centred) and quantitative (technical) insights into daily practices related to local water consumption. The anticipated improvements will relate to reduced waiting times for repairs to broken or poorly performing hand pumps. Prompt repairs are essential because when hand pumps malfunction, many local communities will resort to using less protected water-sources, increasing their exposure to a wide range of water-related diseases. Broken hand water pumps impose obvious hardships upon the rural communities that are reliant on them, and therefore have significant implications for the Sustainable Development Goal (SDG) 6 target of universal access to safe drinking water. This project will facilitate cross-learning between industrial, academic, and third sector stakeholders. In turn, this will be used to enhance both public and policy understanding of hand water pump maintenance strategies.

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EXACTEARTH EUROPE LIMITED	Market Evolution for Small-scale fisheries in Africa (MESA)	£19,607	£13,725
ABALOBI		£42,517	£29,762
Stone Three Communications (Pty) Ltd		£23,160	£16,212

As development takes place under the blue economy umbrella, small-scale fishers are typically overlooked. The 'Market Evolution for Small-scale fisheries in Africa' (MESA) discovery project will conduct research with Mauritian small scale fishing communities to assess their need for an integrated traceability, tracking, safety at sea and digital seafood 'Marketplace' platform, with the goal of enhancing fishers' financial inclusion.

The project will demonstrate the economic, social, gender, capacity and environmental benefits that could be achieved through future implementations in the diverse communities of small-scale fishers in Mauritius (and indeed other countries).

MESA is based on the integration of three existing UK and South African-developed technologies and approaches: the ABALOBI ICT 'hook to cook' platform (including a Fisher catch logging smartphone app and digital Marketplace system); the Stone Three small vessel tracking and safety transponder, and exactEarth Europe's low cost exactTrax / exactSeNS satellite data communication and vessel tracking services. Using human-centred design methodologies, Mauritian fishers will determine the suitability of the proposed technological offering, and their capacity to engage usefully with the technology. Fishers will act as co-creating participants, ensuring that any future service is fit for purpose, informed by local context, is sustainable, and will be readily adopted.

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DEM DX LIMITED	Dem Dx Ophthalmology Clinical Platform	£71,922	£39,557
University of Rwanda		£19,285	£19,285

Visual impairment affects 285 million people globally with 87% predominantly located in low and middle income countries. The World Health Organisation has stated that providing eye care contributes significantly to economic growth and development by reducing injuries and improving access to education and employment. In Rwanda, with a population of 12.3m, 65,000 people are blind, 12% of the population has correctable refractive error, and more than 80% of all eye conditions considered preventable or treatable.

To achieve the goal of reducing visual impairment, Rwanda Ministry of Health has identified the need to increase eye specialists numbers and invest in upskilling/training the wider healthcare professionals in eye care. There are currently only 16 ophthalmologists and 140 Ophthalmic Clinical Officers (OCOs) that serve Rwanda's 12.3 million population.

DemDx, a medtech commercial platform focused on social impact, aims to address this challenge by adapting its innovative Ophthalmology Clinical Platform to provide a tool that trains OCOs and supports them and other healthcare professionals in the clinical setting to reach more informed clinical decisions.

This cost-effective technology will help provide the much needed local ophthalmology expertise, contribute to more patients receiving treatment and reduce instances of preventable eye problems.



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SEAWATER SOLUTIONS LTD	Saline Agriculture for Climate Adaptation (SACA) Malawi	£61,337	£42,936
CHALLENGES WORLDWIDE LIMITED		£24,368	£17,058

For rural communities in Malawi land degradation and the impacts of climate change and natural hazards are key livelihood challenges. The region of Chikwawa is especially prone to environmental strains as it is dryer, lower, and more arid than other regions of the country. Salinity in groundwater and soils threatens the region's already strained arable land resources and vegetation.

Our innovation restores degraded land, turning salinized soils into highly profitable and healthy ecosystems without using any freshwater. We do this by using saline groundwater from traditional wells and modern boreholes which have become saline over time, or those that have been dug into deposits of saline water. While these 'saline wells' may no longer be in use, due to their high salinity levels, this project uses them to build ecosystems-based saltwater farms in which nutritious crops and aquaculture are combined in circular production models.

SACA Malawi follows on from projects led by the team in the last two years in countries like Bangladesh and Vietnam which addresses similar threats, and implements innovative land management practices for the integrated restoration of saline wells to restore degraded land, and create invaluable ecosystems that strengthen the climate resilience of rural communities.

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ANOTHER WAY LEARNING & DEVELOPMENT LTD	Feasibility Study: Powering the Classroom-to- Career Revolution - An equitable, scalable and profitable for model DataU	£112,520	£56,260
DataU		£0	£0

Project description - provided by applicants
This 6-month project will conduct a detailed market feasibility research to intentionally recruit vulnerable men and women and persons with a disability, for training as big data analysts. These trainees will also be equipped with relational soft skills to enable them to navigate employment and life in the big business world. Progress in psychometric parameters, relational soft skills and the professional skills of data analysis of trainees will be monitored and assessed regularly. The project will also facilitate the hiring organisations towards inclusive and equal employment for all trainees.

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SCIENCE TECHNOLOGY AND INNOVATION FOR DEVELOPMENT LTD	Innovative Access to Healthcare for Impact in Remote Communities	£60,614	£34,162
Orkenerei Maasai Social Initiatives		£25,837	£25,837

Access to good healthcare is often challenging in the developing world. But this is greatly compounded for people living in remote off-grid rural communities. Such communities usually don't have any local health officer or clinic. And if they do, the facilities are usually poor, because they lack power, communications and equipment. To access even basic healthcare requires a walk of hours, even days, and/or paying for public transport to the nearest town or city, which is expensive and time-consuming, for a journey that may prove quite unnecessary.

Modern ICT, as we are seeing in the COVID pandemic, demonstrates the power of remote videoconferencing. We intend to test an innovative approach to rural healthcare, whereby a community can access the services of a qualified medical profession remotely at a fixed time each week via videoconference. The system will also incorporate some basic medical record keeping, and the community operator of the system will also be trained to take basic diagnostic measurements, like temperature and blood pressure, which can be done easily with cheap devices. Such teleconsultations will often be sufficient to address basic problems and questions, and can also highlight cases where the expense and time of a clinic-visit is justified.

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BEYOND WATER LIMITED	Scaling Access to Rural Water	£69,401	£48,581
CHALLENGES WORLDWIDE LIMITED		£10,878	£7,615
INSIDER-OUTSIDER LTD		£5,392	£3,774

Beyond Waters's "Scaling Rural Access to Water" project uses Human Centered Design to understand the views of actual and potential customers and stakeholders in order to refine and re-test the design of its products and services as it seeks to increase access to water in rural Malawi. The improved designs of the pumps, the credit systems that make them financially accessible, the maintenance ecosystem that keeps them functioning and the routes to markets through partner groups that come out of this process, will then be brought together into a prototype business plan that will inform how Beyond Water scales up its operations in order to make water accessible and reliable across all parts of rural Malawi while also building a financial viable social business that is owned by its staff and reinvesting any surpluses generated rather than extracting profits for shareholders.

The project will therefore have a significant secondary aim of developing a way of working that is more effective and more sustainable in providing water to poor communities in general and the socially excluded within them than the current model in which infrastructure is given to communities who then struggle to ensure its maintenance and functionality.

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UTTERBERRY LTD	Al Enabled Sensor Systems to Transform Construction Safety in the Philippines	£69,983	£41,990
CONNECTED PLACES CATAPULT		£18,000	£18,000

Construction is the deadliest sector in the world for workers. Lack of regulation and safety procedures increases this tool even more at developing countries. In the Philippines, the fatal injury rate in construction has been steadily increasing since 2011 and reflects the same trend seen throughout the Asia Pacific region, according to the International Labour Organisation. The region is home to 70% of work related deaths worldwide

The UtterBerry sensor system can improve the safety of construction sites by monitoring the infrastructure of both the project and the site to alert relevant workers when a harmful or fatal event occurs anywhere within the sensor networks coverage.

Tested in the UK by Network Rail and Thameswater, UtterBerry's small sensors, embedded in structures provide predictive tools to mitigate against a huge range of events from changing weather conditions to structural stability enabling better informed decisions about the operation of construction and manufacturing sites, generating more employment stability and protecting the health and safety of workers on site.

At this project, UtterBerry will work with Connected Places Catapult (CPC) and in the Philippines, to identify ways in which this product can be embedded into infrastructure development in the country and the region.



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ENTRUST SMART HOME MICROGRID LTD	Entrust smart community EV charging hub for light electric vehicles in Uganda	£33,353	£23,347
E-CARE TECH LTD		£24,831	£17,382
Kee Bee Consultancy Ltd		£27,405	£19,184

It is recognised that current transport system based on petrol/diesel (ICE) motor vehicles is becoming unaffordable and unsustainable, and electric vehicles will be one of the means to address the problem providing the electricity supply is from renewable power sources and affordable.

Sub-Saharan-Africa is one of the regions underdeveloped and experiencing rapid growth in population and economic activities. In terms of modern transport system, it is still a "blank canvass" and the right time to think differently to the developed world and design a public transport system which suits the local society and is sustainable and affordable.

It is about overcoming the problems of poor public infrastructure to help people in Africa benefit from low cost and low carbon transport system -- focusing on an innovative and less costly battery swapping/charging model, that can take advantage of Africa's rapidly expanding, renewable solar PV power generation.

As such, the project aims to assess the feasibility of the design of a smart community electric vehicle charging hub to facilitate light electric vehicles such as motorbikes, tuktuks and small mini-buses in Kampala, Uganda to demonstrate a feasible solution for the country to provide an affordable, clean and sustainable transport system for all.



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3B ADVISORY LIMITED	Human centred design of an affordable insulin delivery innovation for people with diabetes in developing countries	£60,262	£42,183
GO-Pen ApS		£24,977	£17,484

3B Impact works with innovative companies to scale solutions to global challenges. It is working with diabeties device experts at GO-Pen Aps and experienced practitioners at Médecins Sans Frontières UK to commercialise an innovative insulin delivery system, designed specifically for diabetics on low incomes in developing countries, such as Malaysia.

Insulin delivery systems are designed for affluent markets. While the rich can afford insulin pens, 13 million poor people with diabetes take insulin through 3-4 daily injections using syringes. These are not fit for purpose. Syringes make it harder to deliver correct dosages leading to complications including blindness, amputations and death, and produce significant amounts of hazardous waste. Single use syringes are often used multiple times, risking infection.

GO-Pen's solution eliminates the need for syringes, is safer and more affordable. The benefits are:

- 1. a guicker, more discrete injection;
- 2. precise dosing;
- 3. less training needed from healthcare professionals;
- 4. easier to use leading to better treatment;
- 5. lower risk of complications;
- 6. reduced cost; and
- 7. reduced hazardous waste.

Success depends on ensuring users want to use the GO-Pen and that it improves how insulin is used, the focus of this project.



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Participant organisation names	Project title	Proposed project costs	Proposed project grant
DESOLENATOR UK LTD	Water Independence for Haiti: solar desalination for the rural and urban BoP	£85,566	£59,896
ECOLOG INTERNATIONAL (UK) LIMITED		£0	£0
UNTAPPED-INC LIMITED		£0	£0

Project description - provided by applicants
This project will combine sustainable desalination with a human-centred designed distribution model to deliver a scalable water solution for the underserved BoP market in Haiti.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
KOALAA LIMITED	Assessing the economic, technical and commercial feasibility of developing a lightweight, low-cost, industry-leading upper limb prosthetic for Sierra Leone and wider region	£80,339	£54,952
LEONARD CHESHIRE DISABILITY		£5,028	£5,028

After years of regional conflict, Sierra Leone has one of the highest rates of upper limb amputees in the world, with an estimated \>90% having no access to viable prostheses, preventing the fulfilment of normal activities impacting employment, self-esteem, and social acceptance.

Building on a validated concept developed for the UK market, Koalaa Ltd (Koalaa)-a UK spin-out from Imperial College- seeks to address an unmet, global humanitarian need with the development of easy-to-use, ultra-lightweight, durable and low-cost(\>20x more affordable than current solutions) prosthetic specifically designed for the African market.

Utilising a non-bespoke approach and and patented fabric-based socket design, the upper limb prosthesis is suitable for all stump sizes and deliver three key innovations;

- * Highly-flexible and comfortable=extend lifespan, reduces abandonment rates, grows with user.
- * Self-fitting=removes the need for clinic/clinician involvement,
- * Eliminates expensive, rigid materials=80% weight reduction vs current solutions at significantly lower cost

In partnership with the on-the-ground disability partners, Leonard Cheshire(LS) and Melqosh Mission(MM), and with National Government support, Koalaa will undertake a 6-month feasibility study (including 30-patient trial) to identify the technical, commercial and financial feasibility of adapting the technology to region, as well as the logistical, regulatory and geographically challenges to manufacture and sell the prosthesis in-country.



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STEAMA COMPANY LIMITED	Cloud-based consumer account management services to support Indian mini-grid developments	£85,608	£59,926

SteamaCo's smart metering technology enables utilities to sell energy anywhere on the planet. We provide demand-side automation features, based on edge computing, cloud software and machine-to-machine communications technologies, which automate utility operations in real-time. SteamaCo offers the world's most data-efficient smart meter. This helps utilities operate reliably and cost-effectively, even when connectivity is scarce. Cutting-edge network architecture and multiple robust connectivity management technologies offer reliable operations even in low-connectivity environments.

Tariff discovery is often key to a utility's economic performance, and from the consumer's perspective, convenient, reliable payments are essential to trust and adoption of utility services. SteamaCo's wide range of payment integrations and tariffs, coupled with an indelible cloud accounting ledger, work together to simplify and automate payment collection, no matter what. SteamaCo enables transactions even when banking services are not available. Utilities are exposed to several forms of potential lost revenue, including meter bypass, payment disputes and negative payment balances. SteamaCo offers multiple loss-protection functionality, including bypass detection, tamper-proofing, edge computing and an indelible accounting ledger.

SteamaCo currently serves customers in sub-Saharan Africa. This project enables us to partner with Smart Power India to develop a route to providing support services to Indian mini-grid projects.



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PERCHERON (UK) LTD	Temperate Mass Timber for the Tropics	£119,793	£53,907

Percheron (UK) Ltd is focused on displacing carbon-intensive concrete and steel with sustainable mass timber in multi-storey construction. Concrete and steel are estimated to be responsible for approximately 15% of annual GHG emissions while sustainable mass timber is not only 100% renewable but technically comparable and economically competitive.

Percheron's 'Temperate Mass Timber for the Tropics' project is a feasibility study on how to redesign its existing mid-rise building solution for temperate middle- and high-income economies to suit the low income rapidly urbanising economies of tropical South East Asia. Up to 3 billion people are expected to need affordable housing by 2050, the majority in South and South East Asia and if concrete and steel continue to be used to meet this demand it will be impossible to limit global warming to 2°C.

Percheron's project is specifically focused on developing an affordable housing solution for the new Indonesian capital city, to be built in East Kalimantan in Borneo. Indonesia's existing capital, Jakarta, is sinking 7 inches per year and 40% lies under current sea levels. The Indonesian government recently announced that they would be building a new capital city for 6 million people at a cost of \$35bn.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
MARYLEBONE CONSULTANTS LTD	Poa internet sharing model proof of concept	£99,466	£59,680

Poa internet provides affordable unlimited home internet to marginalized communities in Kenya, mostly urban poor and rural areas. By doing so, it enables people to actually tap into the informal or 'kadogo' economy and monetize the sharing of their internet connection. This sharing can be to alleviate cost OR to generate additional revenue streams, using the internet connection. Ranging from cyber cafe, video store, online writing jobs, offering WiFi to their customers or a paid home internet service to their neighbors. In addition, it allows them to become e-commerce click and collect agent, digital banking agent and many more opportunities. This will create resilience within the community with maximized value of the internet for both sharer as well as end-user, access to digital education resources as well as innovative last inch solutions

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
RENES-CARTES ENERGY AND MANAGEMENT CONSULTING LTD	Waste to wealth: The use of plastic waste to produce cheaper and better interlocking paving blocks	£33,320	£19,992
Leeds Beckett University		£7,488	£7,488
Perk Digital Real Estate Developers		£10,489	£3,671
Synergy Engineering Limited		£22,527	£7,884
UNIVERSITY OF HERTFORDSHIRE HIGHER EDUCATION CORPORATION		£15,942	£15,942
Yaba College of Technology		£4,940	£4,940

Nigeria is the largest waste generator in Africa, generating about 2.5 million-tons/annum, with Lagos, the major culprit of the 36 states. 70% of plastic waste that ends up in landfill gets burnt to reduce volume for increased landfill capacity. 60% of Lagos' 18 million population live in slums and below \$1/day. Waste-pickers collecting plastics (sort/wash/pack) to sell to recyclers is a common sight in landfills. Lagos state supports the picking due to its desire to increase recycling. However, with few recyclers and too many pickers, supply is outpacing demand leading to ridiculously low prices of around 15 naira/kg (i.e. 3-pence) of sorted/washed/packed waste plastics.

Popularly used for community-roads, driveways, parking areas, airports, etc., interlocking paving blocks market in Nigeria is worth over 3-millions dollars (Market Publishers 2018). They are cement based and mostly only affordable to rich people/communities or governments due to high costs. Production also consumes natural resources with high cost and embodied carbon (lime through cement, and sand). This project seeks to develop more affordable interlocking paving blocks, produced from recycling 'unwashed' plastic and little sand with u.v. stabilisers to prevent degradation. This will lead to higher prices for 'unwashed' plastics and support better/safer/healthier/more-estimable means of plastics aggregation.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
REACH 52 LIMITED	Expanding access to essential healthcare products and services in undeserved communities	£85,638	£59,947

Healthcare does not reach 52% of our planet, or 3.7 billion people. Both Philippines and Cambodia have witnessed sharp increases in out-of-pocket spending for health services over the past decade. In 2009, annual out-of-pocket expenditure per capita amounted to \$44 in Philippines and \$28 in Cambodia (PPP adjusted figures). By 2017, that figure had increased to \$70 and \$49 respectively.

Our innovation involves developing a digitally-enabled (through a mobile application and web-based backend) on-demand marketplace providing access to affordable athome point-of-care screening and diagnostic services for low-income rural populations, implemented by a network of local female peer workers, and delivered by trained nurses and midwives. We hypothesise that this will increase uptake of basic screening and diagnostic services, contributing to improved NCD case detection and management, as well as improved maternal health outcomes.

This project focuses on the initial research to expand our existing operations (focusing on public health events, access-to-medicines and a range of other complimentary, community-level services) into screening and diagnostic support. This builds on our existing network to create a new business offering led by the UK, improving health outcomes, whilst lowering out-of-pocket costs for poorer communities in Asia.

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RESOURCE FUTURES LIMITED	E[co]work: Co-working spaces for inclusive e-waste management	£20,716	£12,430
Ecowork Association		£15,495	£0
Sofies Sustainability Leaders Pvt Ltd		£64,081	£44,857

The E\[co\]work project aims to design a socially inclusive solution for informal micro-entrepreneurs of the e-waste sector in India and enable their transition and integration with the formal sector. India generates nearly 2 million tons of e-waste annually, with more than 90% of it treated by these informal micro-entrepreneurs. Over 12000 persons, predominantly from minority and migrant communities are engaged in dismantling e-waste in and around Delhi alone. Though this informal sector provides jobs and livelihoods for many families at the base of the pyramid, the unsound and hazardous work practices have proven to be harmful not only to the health of the dismantlers but also to their communities. Based in densely populated residential areas, these practices are polluting the environment and their surrounding neighbourhoods.

Adapting the concept of co-working spaces to the informal e-waste sector, E\[co\]work facilities aim to offer affordable, safe and healthy work spaces with appropriate tools, protective equipment, ventilation, lighting and machines, as well as access to additional support services and training for banking, healthcare, insurance, business administration that are currently not available to these disadvantaged groups.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
AQUAFFIRM LIMITED	Feasibility study to assess viability of low-cost digital field sensor (AquAffirm-As [™]) for real-time measurement of arsenic in drinking water in Bangladesh	£112,779	£59,998

The WHO estimates that over 140m people in 70 countries regularly drink water contaminated with arsenic, which is poisonous even in trace amounts. Long-term exposure through drinking water can lead to arsenic poisoning, which causes skin lesions, cancers, childhood learning difficulties and, often, death. Bangladesh is one of the worst affected countries where up to 50m people drink water with excessive arsenic. Indeed, the WHO called the situation in Bangladesh: "the largest mass-poisoning of a population in history". Despite the scale of the problem and importance of routine testing of tube-wells for arsenic, current field-tests use colourimetric methods that are slow, imprecise, difficult-to-interpret and not web-connected. AquAffirm is addressing this issue with development of the AquAffirm-As(tm), the first rapid, low-cost, easy-to-use digital field-test for arsenic in drinking water. This novel demonstration-ready test represents a significant advance in management of the arsenic problem: its speed, precision chemistry and digital readout substantially improve upon current tests; web-connectivity and algorithmic data-analysis will enable optimised decision-making regarding locations of new safe wells. Through this Phase I project AquAffirm will extend its network of collaborators within Bangladesh and establish the technical and commercial feasibility of the test through contacts within academia, government and NGOs.

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SPACETIMEAI LTD	iHotSpot - Ai-enabled Safe Road	£59,552	£41,686
CONNECTED PLACES CATAPULT		£18,000	£18,000

Brazil is an emerging economy that has made great progress in meeting the UN SDGs. However, the country is behind specific targets in SDG3 (health and well-being) and 11 (sustainable cities and communities). The country registers one of the highest numbers in fatalities and injuries caused by traffic incidents globally. Also, cities in the country are severely affected by congestion.

This project will assess the technical feasibility and validate the demand for iHotSpot. iHotSpot is a prototype stage Al-enabled system that provides real-time predictive analytics for traffic conditions (flow and accidents). The solution which has been developed by SpaceTimeAl, a spin-off from University College London SpaceTimeLab, aims at enabling users to better plan and allocate resources to avoid traffic accidents and congestion, supporting Brazil in meeting SDGs 3 and 11\. The project is equally expected to promote other capabilities related to the technology such as public safety.

The project will bring together SpaceTimeAl and Connected Places Catapult (CPC) which will leverage its expertise in human-centred design for the development of user-centric smart cities solutions and ODA funded initiatives promoting socioeconomic impact. The project will receive on the ground support from the Development Agency of the Metropolitan Government of Belo Horizonte.



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STEPHEN BUDD MUSIC LIMITED	Nigeria Creative Economy Catalyst	£30,403	£21,282
Afrinolly Nigeria Limited		£29,680	£20,776
HENLEY BUSINESS SCHOOL LIMITED		£29,671	£17,803

Nigeria's economic recession is worsened by oil prices slump. With 180m population, 60% youth demography, high poverty, and 35% unemployment rate, urgent interventions are necessary. But the creative industry is a viable non-oil sector that can lead to the diversification of Nigeria's economy.

Stephen Budd Music Management, Afrinolly Creative Hub and Henley Business School partnered to create The Nigeria Creative Industry Catalyst. This innovative platform integrates EDUCATION+INCUBATION + ACCELERATION+MARKET-NEXUS in the music industry.

The objective is to develop a digital-driven ecosystem that leverages the full value chain of the Music Industry, within a "Creative Village" to generate a sustainable contribution to GDP, driven by the combined effect of the global music market growth and huge demand for Nigerian music.

Our partnership with MTN Nigeria for **annual \$1m sponsored** MTN "Yello Star" Music Reality Show provides us access to thousands of music talents (in the value chain) per year, including those from both urban and rural geographic zones, driven by social-inclusion and gender-balance: [https://www.mtnonline.com/yellostar/][0].

The Nigeria Creative Industry Catalyst will annually transform 2,000 trainees to successful creative entrepreneurs and thereafter connect them to global market nexus to eventually generate up to 5% of GDP over the next 10 years.

[0]: https://www.mtnonline.com/yellostar/