

The background image is a wide-angle photograph of a mountainous region. In the foreground, there are several large, dark green trees and bushes. Behind them, a range of mountains is visible, shrouded in a thick layer of white and grey mist. The mountains are rugged and covered in dense vegetation. The sky above is a pale, hazy blue.

WE ARE

**SUSTAINABILITY TECH** | A COMPANY OUTLINE



If you are not in it for  
the adventure, why  
bother starting a  
business...





## LET US INTRODUCE OURSELVES

Specialising in rural tropical landscapes engaged in agriculture, forestry and fisheries. Sustainability Tech is a technology startup implementing custom built monitoring and evaluation (M&E) systems. Using a combination of the internet of things (IoT) enabled smart monitoring devices and digital survey applications, we provide integrated systems that aide companies, governments and communities in achieving better managed, more sustainable, data driven landscapes.



# And so it begins...

After identifying a need for existing ‘certified sustainable’ production schemes in the forestry and agriculture sectors to streamline and digitize their certification processes. Sustainability Tech was originally conceived as a company making integrated surveying applications for mobile devices targeting certification bodies, research organisations and conservation & development projects. However, our scope quickly grew and diversified.

Surprised by the sheer number of organisations and businesses still collecting data traditional way i.e. paper based collection, data entry into excel/basic and poorly presented analyses. Every data handling step invites human error. Inevitably, errors accumulate and cascade throughout the dataset, leading to diminished quality and accuracy of analyses and reporting. At best these accumulated errors result in cost/time increases and loss of data, at worst, poor management decisions. After talking to a range of actors and identifying these issues, Sustainability Tech started to develop new tools to address these problems. We build project specific dashboards that are available on any device providing up-to-date monitoring, modeling and notification services on any type of data set. Combined with a range of smart sensors that we deploy in the field, we have created a full service solution to optimize existing systems and handle new challenges. By working with our clients we can enable them to act in near real time to both physical and social changes in their landscapes, which up until now has been unprecedented.



# The team

A Kiwi, a German and a Dutchman walk into a bar in Bali... Sustainability Tech was co-founded by three guys with diverse backgrounds and experiences but who are all committed to making a difference. With our range of distinct yet complementary skill sets we began dreaming up our vision of what would become Sustainability Tech.



**Sebastian (35, Germany)**, a specialist in advanced data analysis and statistical programming, with over 7 years research experience in tropics. Peatlands, oil palm production and climate change mitigation are just a few of the areas of expertise Sebastian has in his pocket that have allowed him to work on a wide range of forest conservation projects across Southeast Asia.



**Roy (34, The Netherlands)**, with 15 years programming applications (mainly web), he knows what it takes to automate complex systems. He has worked for renowned clients from across the globe and lead projects that demand both in depth technical knowledge and creative solutions. He is fluent in a multitude of programming languages and is always looking for technical solutions to optimize processes and products, be it software or hardware related.



**Josh (32, New Zealand)** has been living and working in Indonesia for the last 4 years as a forestry research specialist. Working on a range of international projects, primarily in data analysis, statistical programming and project management roles. With an academic background in ecology, biodiversity conservation and integrated landscape management in the tropics. Josh brings the right set of transdisciplinary skills required for building integrated systems in complex tropical landscapes of global importance.



# Our mission



Evening install of the Lora gateway (which receives the messages from the peatland) in Sumatra by our local field staff

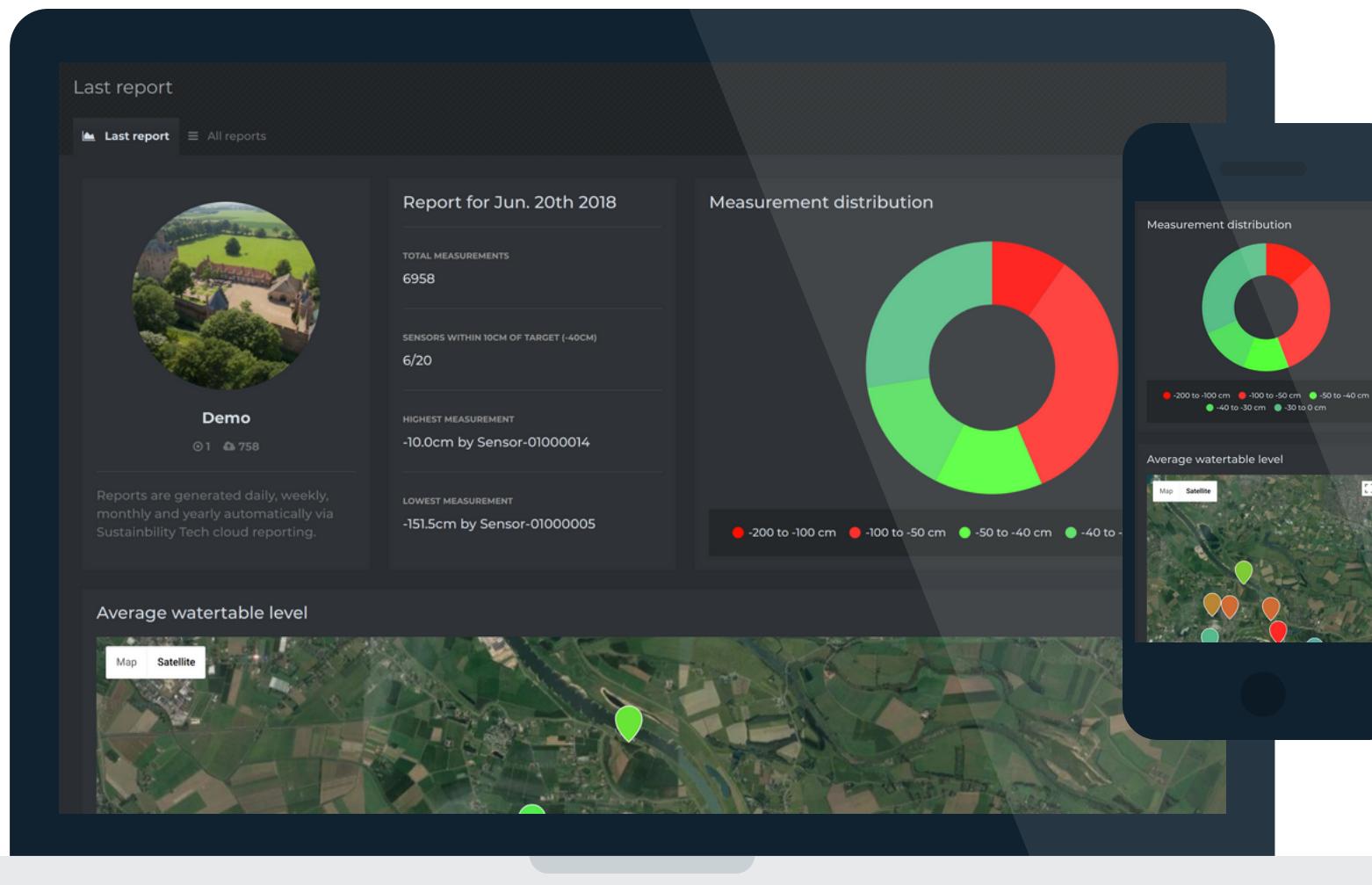
Food security, climate change, biodiversity loss are but some of the critical issues facing the planet today. We at Sustainability Tech believe that technology not only will but must play a major role in meeting the global challenges ahead. Pressure is mounting on companies and governments to move away from the business as usual approach to production and growth. From a model where—historically—the inherent value of ecosystems and nature has been largely ignored. Sustainability Tech wants to be on the front lines providing the capacity for improved management through technological innovation and a drive to make significant positive change towards profitable, equitable, transparent and sustainable land use.

Maintaining a sustainable productive planet and conducting profitable business does not need to be mutually exclusive. Without private sector involvement, investment and commitment to sustainable practices, the already daunting planetary challenges ahead will likely continue to grow unabated. Whether small-holder or big player, our mission is to bring the principles of big data to areas and sectors that are lagging behind in technological innovation and yet are likely to benefit the most from data driven solutions. Sustainability Tech is aiming to be the world leader in developing the systems to deliver these solutions.



# Products & Services

All rural agricultural environments—especially in the tropics—present their own unique challenges when it comes to developing and deploying technologies. Harsh conditions and varying levels of infrastructure of varying quality and capacity means that a one size fits all approach is unlikely to be successful. Our solution is to offer custom built, project specific systems for our clients. Our systems are modular. We combine a number of different elements to put together an almost off the shelf package to meet our clients needs, allowing us to build custom end products whilst maintaining cost effectiveness.



We have built a cloud based dashboard tool for monitoring and data reporting that handles and processes incoming data. Our dashboards can be tailored to be as complex or as simple as desired. With its fine grained user management system we can enable/disable all preexisting modules and easily develop new ones to meet diverse client needs.

The other half of our system is our sensor networks, these are 24/7 connected to the cloud sending back realtime data from the field. We have developed base nodes that can plug in any type of sensor required. If there is a sensor on the market we can utilise it.



# Connectivity 1/2

Although the Facebooks and the Googles of this world are trying to make the world one connected place. We are seeing work areas with no or very limited connectivity.

This means that we have to come up with our own way of transmitting data securely.

The traditional methods—WiFi, GMS/LTE—have significant downsides, making them suboptimal options in many of the landscapes and projects we work on. Some key factors are:

- **High power usage**, systems with these wireless protocols are power hungry meaning they require frequent battery changes.
- **Limited range**, WiFi especially is not suited for areas where you have to deal with heterogeneous landscape configurations containing trees, forests or other signal attenuating elements.
- **Subscriptions costs**, although GSM/LTE have the range (provided the network structure is in place and sufficient reliable coverage can be attained), operating a large number of sensors requires each sensor to be equipped with a sim card. This is not a viable option if the goal is to maximise system coverage with a high density of sensing nodes.
- **Phasing out old technologies**, old 2G networks are often the best alternative, because of lower costs and longer range (due to lower operating frequencies). Unfortunately, these networks are being phased out in favor of modern mobile networks that have more bandwidth and so will become unavailable in the long run.



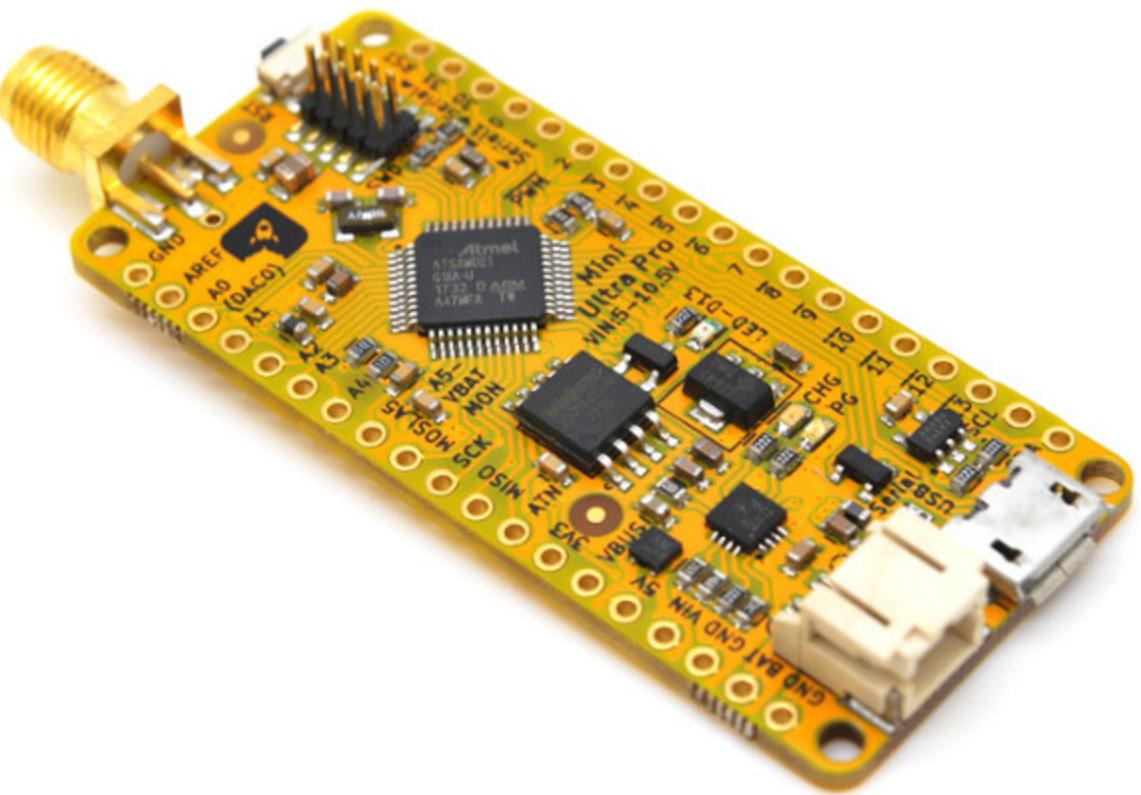
## Connectivity 2/2

LoRa checks for us all the boxes as a data transmission technology. This is a system that mitigates all the aforementioned issues. LoRa is low cost, low power and long range. there are no data subscriptions required and the transmission module can be run on a single AA battery for years. It is fast becoming a new global standard and it is not going anywhere soon.

We have built our LoRa nodes on top of The Things Network, which is a global open source infrastructure that handles all the data transmitted between our gateways (LoRa receiver stations in the field) and our data/application servers (dashboards). This enables us to take advantage of the open source community and end-to-end AES128 encryption to keep the data secure.

Further cost reductions are made possible, as there is no need to operate additional servers to get our data around the world. We are also set to benefit from the relentless innovation of The Things Network. Tests have been conducted in Europe that made it possible to send data over 700KM from sensor to receiver!

	Long range	Low power	Low costs	No subscription
WiFi			●	●
GSM/LTE	●		●	
Satellite	●			
Sigfox	●	●		●
LoRa	●	●	●	●





# Our sensors

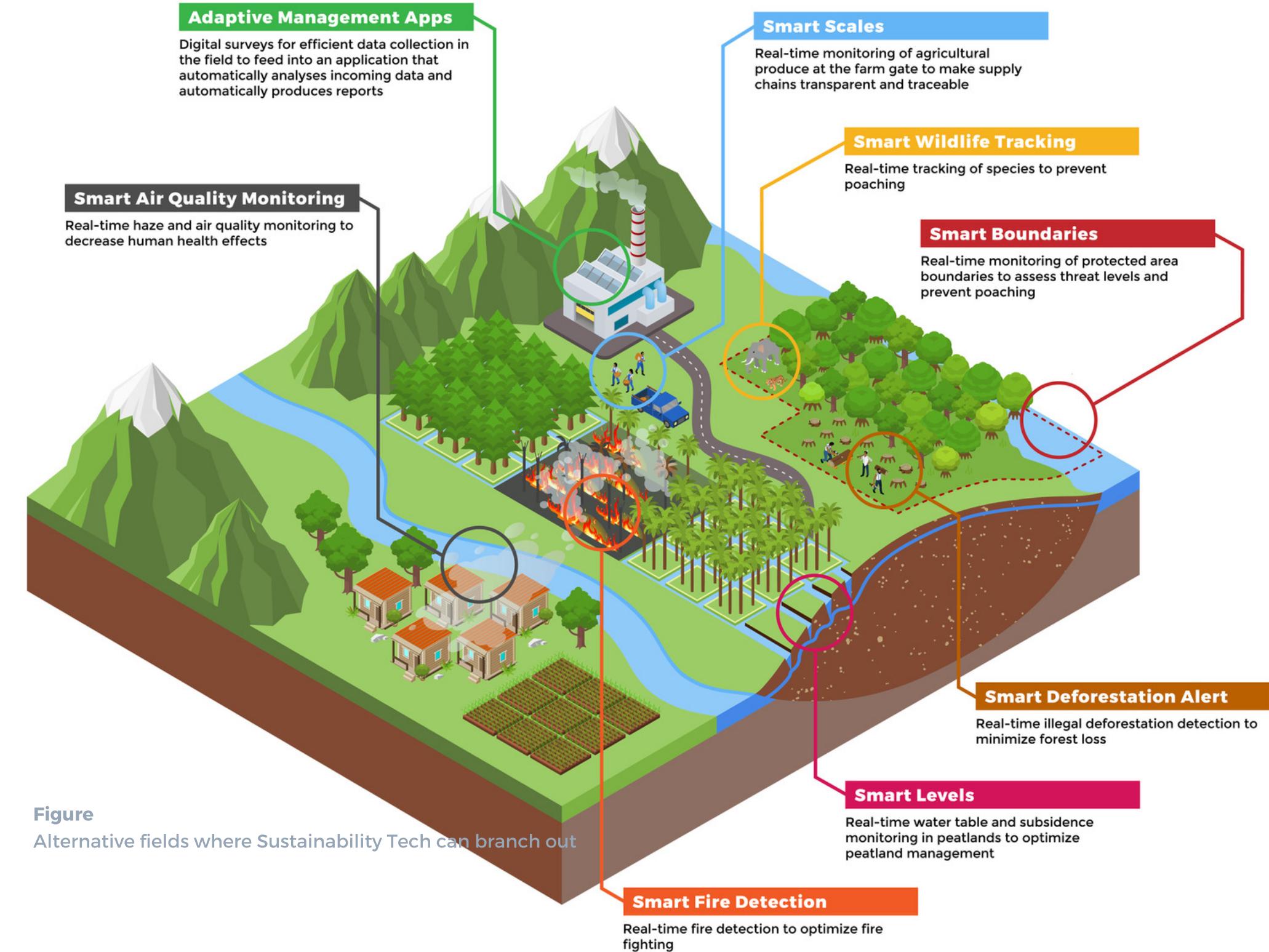
We design our printed circuit boards (PCB) inhouse.

This enables us to have a board that can plug and play any type of sensor. The LoRa PCBs are built by our Malaysian partner who design top quality low costs LoRa modules that squeeze out every last milliamp from the components to maximise battery longevity.

## SmartHydro

Our first sensor developed and deployed is our SmartHydro water table sensor. Designed for rural peatlands to be installed in standard dip well systems used for taking manual measurements of the groundwater levels. SmartHydro sensors, when connected across our LoRa network, can be programmed to send data at any frequency. Whether you want up to date data on the water in your landscape for predictive modelling of crop outputs.

Or you like to enable active management of the water table itself. SmartHydro sensors can help to increase productivity and reduce losses. With an effective range of 2 meters our sensors are more than enough for management systems of most tropical crops whether they be trees, oil palm or pineapples.





# Current projects

One of our current projects is with a large international NGO funded out of the USA where we have installed a network of SmartHydro sensors. The project is situated in the heartland of Sumatra where issues of land use around peatlands and Oil-palm are at the forefront of the Indonesian government's plans to restore 2 million ha of degraded peat. Our sensor network in the project site covers an area of over 25,000 Hectares with plans to scale up currently under negotiation. The NGO, local farmers, community groups and government all now have access to our live data streams via our custom built dashboard. Combined with our backend analytics all these actors now have a real opportunity to better understand how their landscape hydrology works and how best to manage it to maximize profits, minimize environmental damage and meet strict new government requirements.





# Data is money

In this modern day and age, data is money. Data itself holds little value as just numbers on a page or 1's and 0's on a silicon chip. But by turning data into meaningful information and by knowing how to interpret this information, it becomes invaluable when used to drive decision making. This is the goal of Sustainability Tech, to provide platforms for data driven decision making. In order to gather as much data as possible we keep the cost of our sensors low, allowing us to build extensive high density networks over large areas. Our business model revolves around yearly subscriptions to our data servers and models which can give our clients meaningful information to optimise sustainability and profit.

Think of examples like gathering data via soil chemistry and moisture sensors that tell us something about the state of agricultural land and notify us when fertilizer needs to be applied. This can then be hooked up with fertilizer market prices and predict what the best times are to buy, empowering the farmer to make better economic decisions. We are already making a difference to the management of Oil-palm plantations in Indonesia where water table data from our SmartHydro sensors are helping producers and local government decide where and when to block canals in order to raise and lower water tables. These decisions are based on complex hydrological models developed by us and our partners.



# Our advantages

**Cost competitiveness:** One of the key reasons why technological solutions have remained out of reach for many in the sector is the perceived low ROI on what is often over-priced and underserviced. This is particularly true in the emerging markets of the global south where buying power is often low and there is a reticence to invest capital in new systems. Our business model is simple. We design and build hardware that is fit for purpose. By using a Low Cost High Tech (LCHT) model we are able to leverage the fact that Indonesia is growing into one of the most connected countries, with ever expanding network access even in the the most remote parts of the archipelago.

**Local knowledge:** Our founders have lived and breathed the Indonesian environmental and agricultural sector, with over 12 years combined experience. The old adage that one size doesn't fit all is particularly evident in such a diverse and complicated country as Indonesia. Where other companies may see this as a risk we see it as an opportunity. This is why Sustainability Tech builds, modular project/programme specific tech ecosystems. We work closely with our clients to ensure their needs are met in the most cost efficient and sustainable way with a good understanding of the legal, business and environmental policy environments.

**Network Connections:** Our founders have developed a large professional network of agribusiness leaders, national and international NGOs, research organizations, engineers and politicians. Having pick up the phone access to such a diverse range of sector interests gives Sustainability Tech a large leg up. We aim to continue leveraging these relationships and direct them towards understanding and implementing better systems. Together with our relations we hope Sustainability Tech can become a market leader. We are currently in talks with two large international NGOs and an Agribusiness leader about deploying at their project sites.



A COMPANY OUTLINE

# Why Indonesia 1/2



## Why Indonesia 2/2

Tropical landscapes are a nexus of both global and local socio-environmental issues, which is reflected in both international discourse and policy. Accordingly, international investment from both governments and the private sector have seen similar levels of focus with Paris accord signatories committing \$100bn to climate financing alone by 2020 and estimated \$141mn and \$131bn from private sector investment and development finance institutions respectively.

A large proportion of this money is expected to be funneled into the global south. With developing countries set to receiving project funding to help tackle big social and environmental issues. Similarly, the business environment in South East Asia is opening up and beginning to see increased investment due to rapid economic development and increased market access. Importantly for us, much of the investment is being directed towards agricultural commodities or agritech.

Big data, analytics and connectivity are rapidly reshaping every sector of the global economy. The innovation and tech environment in Indonesia is well set to grow with the country now boasting a number of tech ‘unicorns’. Sustainability Tech aims to be a big driver of the Indonesian technology sector. According to the Tech in Asia database, Indonesia picked up US\$1.74 billion of tech startup funding in 2017 leading Malaysia and Vietnam in the South East Asian stakes and agritech is among the industries that have the most potential for growth and expansion. The market for our services in Indonesia is large and the playing field remains wide open with little to no local competition.

Under both international and local pressure to better manage the production of agricultural commodities and preserve key ecosystems, companies are increasingly asked to do more to meet the ever growing list of rules and regulations around land use and best practice. In Indonesia this is particularly true, given the global spotlight put on deforestation and the resultant social and environmental impacts driven by widespread fires and biodiversity loss. Countries like Indonesia have signed up to some big global commitments with a number of large projects in the works, such as the plan to restore 2 million Hectares of degraded peatland. Sustainability tech is already making a difference to restoration efforts in Indonesia and over the coming years will be building on our relationships with implementing partners and government to cement our role in large scale projects such as these.