



How local manufacturing is redefining humanitarian aid

Advancements in technology and design mean that, now more than ever, supplies made in the field can make all the difference when it comes to disaster recovery and helping war and weather-torn areas. Field Ready's Eric James explains how

In regions where something as simple as an umbilical cord clamp or a plastic u-bend can help save lives, local manufacturing can have a hugely positive impact. Hard-to-reach areas stricken by disaster, conflict and poverty can be slow to receive emergency aid, and broken or non-existent supply chains often mean that people don't have the equipment they need when or where they need it. Access to the right technology can circumvent supply chain problems and mean the difference between waiting weeks and sometimes months for medical equipment, power or clean water, and getting systems up and running in a day or less. But local manufacturing isn't just about the technology. It's about putting the people – the communities – at the heart, focusing on the support they need on the ground. We can then apply design thinking and user-centred methods to map the technology best suited to their needs and alleviating their suffering as quickly as possible – not the other way around. While 3D printing parts in these remote areas can often be a good fit for cutting out supply chains and speeding up access to much-needed equipment, we understand that is not a panacea, especially when it comes to creating high volumes of equipment or parts quickly. We've seen success in local manufacturing using technologies that make the most of available materials. In March last year we worked with local Syrians in the immediate aftermath of bombing raids to create airbags designed to lift heavy debris from collapsed buildings to rescue trapped civilians. By manufacturing the bags on the ground with local materials (such as wood, metal and recycled/recycled plastic), we were able to respond more quickly – saving time, money (the locally produced bags were 90 per cent of the cost of commercial equipment) and, most importantly, lives.

Hurricane relief
After category five hurricanes Maria and Irma hit the US Virgin Islands in December, the island's energy systems were devastated, leaving residents waiting for days and weeks for their power to be restored and for aid to arrive. Our team worked with locals on the ground in St Thomas to round up solar panels that looked damaged beyond repair. After testing them, we found that many were still functional – they just needed to be charged. Rather than waiting weeks for new parts or panels to arrive, we used CAD software and a 3D



printer – powered by industrial batteries – to create a prototype part to attach a power lead from a solar panel to a large battery on site. The battery would give the solar panels enough of a boost to start charging. Within a day, we'd perfected the design and soon the panels were back up and running with the charge they needed to get to work powering lights, mobile phones, laptops and even some Wi-Fi stations throughout the island.

Restoring some local power meant opening up communication channels, helping to restore hope and taking those first steps toward an easier everyday life for those hit hardest.

Supporting innovation

Necessity truly does breed invention and we see this time and again with local manufacturing. Since the 2015 earthquakes in Nepal, we've worked alongside local communities using manufacturing technologies to address health needs and support projects aimed at improving livelihoods, preserving their environment and increasing safety measures so that future natural disasters take less of a toll.

To improve the efficiency and safety of wood-burning cookstoves used throughout Nepal, local innovator Madhukar KC had spent 10 years perfecting his design to get more oxygen to the wood so it burns more efficiently.

By translating his wood-carved burner design into a CAD model and printing it, KC was able to take his mould to a local sand-casting foundry, where it was cast in aluminium and cast iron, creating a safer and more efficient burner. His design uses fewer wood resources, burns more cleanly and cooks faster. KC has since been

awarded a contract by the Nepalese government to make 210,000 cookstoves – providing him with not only a sustainable income, but also a growing and successful business.

Leaving behind knowledge

Local manufacturing will benefit as applications such as 3D printing evolve and improve – but that does not mean it is limited by technology. As we've seen, the success of local manufacturing is often driven by extreme circumstances – it is not until traditional supply chains are interrupted or broken down that local communities across the globe are forced to become more self-reliant.

Empowering local communities and working alongside people to combine creative problem solving and technology can make all the difference in those hours following a crisis – saving lives and improving livelihoods. We start by alleviating immediate suffering and progress to implementing longer-term solutions, so when we leave a region it's not just technology we're leaving behind, but shared knowledge and expertise. ■

Eric James, PhD – co-founder and executive director, Field Ready, a not-for-profit organisation

Would you like to learn more about local manufacturing and humanitarian aid? Check out Field Ready's good works and join them from 10-12 July at this year's Additive International (formerly the International Conference on Additive Manufacturing & 3D Printing): www.additiveinternational.com