

Field Ready meets humanitarian need by creating supplies locally in ways that are better, faster and cheaper than current ways.

We work in the field, supporting aid agencies and NGOs, pioneering new techniques. We not only provide supplies in ways that are faster, cheaper and better but we also pass on these skills and capabilities to others. By doing this, we drive ecosystem change at scale, encouraging the humanitarian sector to work in new ways, and enabling more people to manufacture useful objects locally in a sustainable way.



FIELD READY

Our Approach: How We Work



Our key objective is to make – fabricate and manufacture – useful items, such as medical and water-related devices, where they are needed. Our five-step process is outlined below. Field Ready starts by working with local communities and relief workers to identify real needs on the ground, then solving problems through design and local manufacturing. Our assessments use empathy to understand people problems. We use design to ideate and co-create workable solutions with people who are closest to the problems – the end users. Following this, we create designs and make essential humanitarian supplies, which can be made anywhere, often using local or recycled materials.

Next we then share our work and ways of doing things. We also train local people and aid workers to identify and solve problems, and to make and manufacture things themselves. We provide designs, instructions and training materials online, making it easier for people in humanitarian situations to find practical solutions to problems they encounter, and connecting people so they can collaborate. Starting in 2017, Field Ready has been enabling our most useful designs to be replicated in other places, by creating “kits” which provide all the equipment and information needed for reliable local manufacture of specific key supplies, and identifying business models which will enable these kits to be adopted at scale. All this makes humanitarian aid more efficient and effective, providing supplies to people in the most challenging circumstances, empowering them with new skills to recover and rebuild, and supporting resilience and livelihoods.



Unlike other aid organizations that emphasize technology, Field Ready is not focussed on a single manufacturing technique, product type or location, or “a solution looking for a problem.” This means we find appropriate solutions to the problem in hand, and use fast testing and learning so that we can rapidly figure out what works, and what doesn’t. This variety enables us to learn about both the breadth and depth of different needs and contexts, so we can spot opportunities reusing techniques and ideas, and develop rich and well thought out solutions that can be applied in many situations, enabling us to quickly grow our impact. So our innovation is not a technology, product or service but our approach itself. Ultimately, we are developing an ecosystem, incorporating both people and technologies, which will transform aid supply chains worldwide.

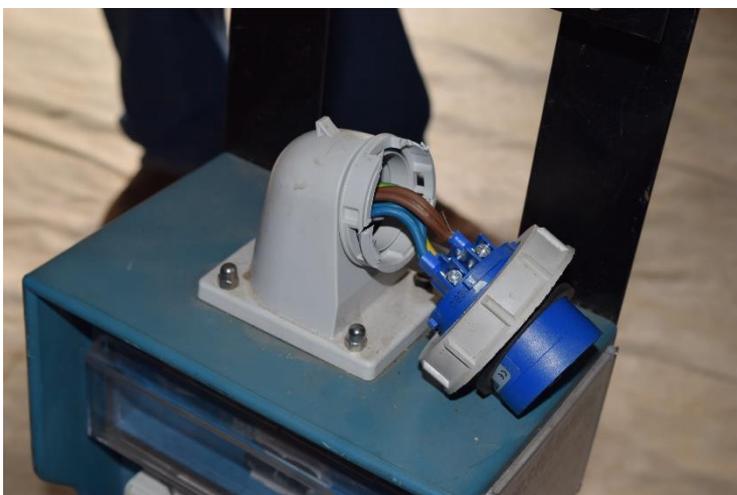


Case study: Replacement parts

Humanitarian operational need: Following the 2015 earthquake, Field Ready spent some time at a hospital in Nuwakot District which had collapsed in the earthquake. Aid agencies had donated tents and emergency equipment, but unfortunately after only a few months many pieces of equipment had started experiencing failures due to the harsh environment. One of the worse failures was damage to a plastic socket on a power distribution unit in one of tents, depriving the tent of power. Because of this, the medical staff were severely limited in the services they could provide.

Challenges: In developing countries, high value assets such as medical equipment are often second-hand donations, not necessarily designed to be robust enough for these challenging situations. When they break, it is hard or impossible to get new components, simply because the equipment is often obsolete and parts are no longer available. In other cases, specific complex component parts are needed which are not available locally, and may take a long time to arrive.

Field Ready response: Field Ready’s engineering team in Nepal measured up the original connector and created a 3D computer model for a replacement part. Field Ready teams often travel to the field with a field appropriate 3D printer, so the same day were able to print out and install the replacement part. The tent was able to receive power again, and staff could return to delivering much needed medical services.



Our results to date

We have proven our approach using local manufacturing of humanitarian supplies using a variety of manufacturing techniques. This has been done in a variety of countries and contexts including the US, Haiti, Nepal, Kenya, and Syria. We have a wide range of partnerships, and are now extending our work in other humanitarian situations, field testing new manufacturing methods and new design solutions.

We've shown that it is possible to use 3D printers in remote and challenging settings, and that we can enable local people to identify their needs and make the items they require themselves. As part of the Syria response, we have designed a lifting airbag for use in search and rescue, which can be made where needed (including besieged areas) using local materials and simple techniques such as sewing and plastic welding, which is a fraction of the cost of commercial alternatives. We are now evaluating other techniques, including injection molding, and plastic recycling and reuse systems, and developing standard kits of robust manufacturing equipment suitable for field use, repairable and maintainable, and well documented, including all the manufacturing tools, plus necessary power and network infrastructure, needed to make a wide range of items.

Case study: 3D printed clinic supplies

Humanitarian operational need: In Nepal and Haiti, we encountered small clinics where simple supplies were unavailable due to supply chain problems. In Haiti, we met midwives with no sterile supplies left, using pieces of string to tie off umbilical cords where a sterile closure was needed. In Nepal, clinics damaged by the earthquake were left short of basic medical equipment. Aid agencies were in the process of assessing the need and procuring these much need items, but supply chain issues meant that clinics were waiting 4-5 months for any equipment to reach them.

Challenges: Field Ready recognise the care that needs to be taken when making medical devices in the field. At present, we focus on Class 1 disposable devices, or devices which do not require sterilisation before use. Whilst it is possible to produce some Class IIa and b devices with 3D printing technology, this would require a more involved product development process.

Field Ready response: Field Ready designers worked in the field to enable clinics to access a small selection of equipment more quickly. Items developed include disposable forceps, fetoscopes, otoscopes and simple orthotics devices (which can be thermoformed to provide at exact fit for the patient). In some cases we were also able to make product improvements through co-design with relief workers and clinicians – such as for a non-surgical kidney tray, where the 3D printed item is more stable and harder to knock over, whilst retaining a curve so it is easy to scoop implements out. As well as supplying items to meet local needs, we have shared the designs so others can reuse them elsewhere, and Field Ready teams use the designs in other responses.





Next steps

Field Ready is expanding its work with more country deployments, new techniques and designs to help address operational needs. We are keen to work with new partners and to learn from them what problems and items are most urgently needed in the field, so we can both create local manufacturing solutions today, and plan deeper R&D for tomorrow.

Field Ready is currently a recognized leader and innovator around local manufacturing for humanitarian purposes, and we want to extend that in the coming months and years to catalyse sector discussion and learning about quality levels and safety standards for supplies used in relief work and crisis situations. Longer term, we plan further work on shared practice for quality control of distributed manufacturing in low resource environments, enabling more complex and higher risk items to be made in confidence in more locations. We would like to explore the potential of smart technologies, such as computer imaging, which can support quality assessment in the field, and also ways to indicate or certify the level of reliability of shared designs for digital manufacturing.

About us

Field Ready is a 501(c)3, a charity incorporated in the USA. We are active and mobile around the world, including in Nepal, Syria, and Jordan, and are preparing programs in South Sudan and Myanmar. Our management hub is in Chicago and we have an engineering hubs in San Francisco and Cambridge, UK. We work extensively with partners both globally and locally. Field Ready has been widely recognized for our work by various media outlets and through numerous awards including as one of 2016's "Most Innovative Organizations of the Year" by Classy.org and at the World Humanitarian Summit, Field Ready was recognised as one of the top five innovations in the sector.

Our team is made up of experienced humanitarians, engineers and designers, and incorporates expertise in building and growing international non-profit organisations, innovation and technology. Field Ready's co-founder and Director, Eric James, is a humanitarian with nearly two decades of experience leading disaster relief projects around the world, and is the author of "Managing Humanitarian Relief: An Operational Guide for NGOs." Co-founder Dara Dotz is a talented designer, who has pioneered 3D printing in remote environments on earth and in space, and empowering people through collaborative design; in 2016 she was honoured by the White House as a Champion of Change for making. Our global team also includes Andrew Lamb, former Chief Executive of Engineers Without Borders UK, Mark Mellors, a highly skilled mechanical engineer with experience in many sectors, and Laura James, an engineer with a Cambridge PhD and a track record of leadership roles in high tech and innovative startups and high growth organisations.

Case study: Water pipe fittings

Humanitarian operational need: Leaking pipes due to improvised connections causing poor water supplies to displaced people in camps in Nepal. In South Sudan, it can take weeks or months for relief workers to secure supplies such as water and sanitation components, severely impeding action to save lives and reduce suffering; Water for South Sudan identified a need for such components and the ability to repair WASH equipment locally.

Challenges: Aid workers operate in unpredictable settings, and can find themselves needing to join unusual pipe sizes in strange configurations. It would be a never-ending task to create designs for all the possible pipe fittings in the world.

Field Ready response: Field Ready, together with a university team, have created an app which allows the user to input the sizes of pipes that need to be, and automatically generates a 3D model of a tailored pipe connector, ready for 3D printing. We have tested these connectors in Nepal (where they were still working well without leaks after 6 months) and in South Sudan, using remote 3D printing.



Recent Media & Links

ABC feature on Field Ready's Ram Chandra Thapa and our work meeting medical needs: <http://bit.ly/FR3DPNepal>

MSNBC video featuring Field Ready's Abi Bush and her work in Nepal: <http://bit.ly/FRNepal>

Field Ready Haiti video: <http://bit.ly/FRHaiti>

Other coverage of our work: <https://www.fieldready.org/in-the-news>

Twitter: [@FldRdy](https://twitter.com/FldRdy)