H_2Grow

Name: H_2Grow
Organization: WFP (World Food Programme)
Year launched: 2016
Countries: Peru, Algeria, Chad, Jordan; Kenya, Sudan, and Namibia in pipeline
Users: Peru - 2,000 vulnerable people; Algeria – 3,000 refugees

In May 2016, fresh fruit and vegetables were hard to come by in the slums of Peru. Space was limited for personal gardens and the vegetables bought in local stores were often either too expensive or contaminated by chemical growing agents in the soil. To address this issue, the World Food Programme (WFP) Country Office in Peru, in collaboration with the slums' populations, developed the idea to use hydroponics for growing fresh food. The Country Office in Peru approached the WFP Innovation Accelerator to ask if they could pilot hydroponic growing to improve the access to fresh food for the slum population outside of Lima. Hydroponic growing is a soilless cultivation technique, which saves up to 90% of water compared to traditional agriculture, and can be grown anywhere (such as in urban dense locations, in refugee camps or even deserts).

The WFP Innovation Accelerator agreed to the idea and invited key innovators from the Peruvian office to participate in an innovation bootcamp. As Hila Cohen, International Business Development Lead at WFP's Innovation Accelerator described, "We wanted to see the potential to create a successful concept and to have impact on a larger, more sustainable scale." Once the initiative went through the Accelerator's one-week, intensive bootcamp and a first version of the hydroponic model was designed, Nina Schroeder, then a project manager with the WFP Innovation Accelerator (now New Ventures Manager and Hydroponic Innovation Lead), was sent to Peru to test it, and develop a proof of concept. Nina worked with the local office for more than a year, implementing a human-centered design focused on understanding the users' needs and requirements.

The initial idea was to equip poor families in the slums with the know-how to grow their own hydroponic gardens in limited space with locally available materials such as wooden pallets or plastic containers. These gardens could be created on roofs or entryways of small flats. WFP intended for the gardens to be fully sustainable to empower families to be self-reliant. The model projected that a family would be able to pay off the initial investment for the hydroponics equipment within three months of growing, as the gardens would produce enough food to be able to feed the family and take some to market.

Information about the hydroponics initiative, termed H_2Grow, was disseminated to other WFP country offices. In November 2016, a Sahrawi refugee living in Algeria named Taleb Brahim read about the hydroponics concept and realized that this could work in the desert. Taleb was an agricultural engineer who had lived in the refugee camp since he was eight years old: it was an isolated place that struggled to feed its livestock who played a crucial role in the ecosystem of the camp (both as sources of food as well as trade).

Together with WFP's Algerian country office team, Taleb was invited to the WFP Innovation Accelerator, where Nina and WFP's local partners worked with Taleb to ideate and design the proof of concept for Algeria. WFP started off by bringing a high-tech hydroponic growing container to the camp to test it and understand the local context. After initial testing, they found that the container could grow local barley fodder to feed the goats in just seven days from seed to harvest. However, the team had a to find a way to move from the costly high-tech container to a sustainable solution that would work in the long run for Taleb's community. The team had to find a way to keep it sustainable in the long run for Taleb's community.

With Taleb's help and other refugees in the community, WFP and local partner OXFAM built a localized version of this container. Replacing expensive imported materials with locally available material and expertise, the local team brought the price down to a fraction of the costs. The local container produced slightly less barley per day, but the cost savings made it a tremendously better option.

Figure 1: Taleb, a local Sahrawi engineer, helps a mother in Dakhia camp understand how to use the hydroponics unit.

This first local version was completed in March, and by Dec 2017, there were 50 different size and style replicas of this local unit throughout the camp, including versions where four families together took care of one unit, which produced enough fodder for all their goats. WFP, Oxfam, and experts from Fraunhofer Institute helped Taleb and the team to bring the initiative to scale: in total, an average of 2,000 kg of fodder were produced per day across existing high-tech and low-tech units, as well as household kits, reaching a total of 2,600 people. "We could see the huge impact after a short while," Nina says. Milk production from goats fed with H_2Grow fodder increased by over 200% compared to the goats eating the traditional fodder of mainly leftovers and garbage, while meat quality and quantity also improved considerably. Refugees were also able generate additional income by selling surplus fodder.

WFP then took this localized model to Sudanese refugees living in the Sahel region of Chad, where harsh conditions and climate change were causing the dry season to extend longer each year. The project was also replicated in South Darfur and refugee camps in Northern Kenya, where the focus was on vegetables rather than livestock fodder. In each case, Nina and her team brought in hands on support to continuously push the local project. Another major success factor was developing a scaling methodology based on the local users' needs. "You can have an innovation in mind, but if you bring something that doesn't solve a local problem and you don't localize or adapt it, it won't work," Hila explains. "Each time the project expands, localizes and adapts."

But WFP found that explaining the benefits and potential of an innovation to a local community was not always easy. Particularly in protracted crisis situations where, for example, refugees were living for 10-20 or more years in extremely dire contexts and many organizations had proposed short-term solutions, there was a certain skepticism towards new projects. For example, initially Sudanese refugees in Chad did not believe anything could grow in their region. Nina and Taleb arrived from Algeria to help the refugees understand and own the project before trying to implement it. Seeing the photos of results from Algeria and hearing from Taleb, a fellow refugee, was pivotal to the

Sudanese refugees accepting and adopting H_2Grow. Nina explained, “It was a very powerful moment. As an idea, it was refugee to refugee. WFP was facilitating, but it really comes down to listening to the ideas coming from the ground and making it happen.”

Key success factor: Involving people in the field (ex. refugees, vulnerable communities, country offices) and spending time on field directly to develop solutions

Key Challenges: Access to inputs, getting initial idea buy-in on the ground and ensuring a continuous, sustainable model

Summary	Tech		Scale	Partners	Impact	Success Factors	
Hydroponic growing technology that enables food to be produced in the desert	**LOW TECH**	**Primary tech used**: Hydroponics	**SCALING**	Non profit, academia	**SOCIAL**	**Initiative**: Strong project owner, user driven	**Organizational**: Adequate financing, executive buy-in