

Thoughts on Designing Refugee Camps:

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I began to study “Integrated Poverty Eradication and Long-Term Ecosystem Rehabilitation” when I saw that it was possible to rehabilitate large-scale damaged ecosystems and that this was the most effective way to transition subsistence farmers toward sustainable livelihoods and end poverty. Following this line of inquiry, I have observed that human existence is dependent on ecosystem function and that when ecosystems are dysfunctional it usually means that human beings, ignorant of the processes that provide their air, water and food, have disrupted them.

Studying ecosystem function and dysfunction has taken me to some out of the way places and occasionally I’ve encountered refugee camps in these remote locations. The camps are necessary to house people fleeing for various reasons, all of them desperate. The lucky ones are in the refugee camps, the unlucky ones don’t make it. Sometimes refugees are fleeing from violence, innocent pawns in a political game. Sometimes they are victims of disasters like earthquakes or floods. And sometimes they are fleeing for survival because of ecosystem collapse. Whatever reason they are there, life in a refugee camp is a precarious thing.

The fact that people must flee and seek refuge has become a way of life for millions of people. The UN High Commissioner for Refugees estimated in June 2009, that more than 42 million people have been uprooted from their homes around the world, by various causes. Currently millions of these unfortunate people are in hundreds of camps scattered around the world. I have enormous respect for the people working in this field trying to help the people living in the camps. Although I have never been called to work in refugee camps I have occasionally wondered whether I would have the strength to endure and serve in such conditions. Although I have a good imagination I’m pretty sure that I can’t imagine what it would be like to be one of the millions of people forced to flee their homes and live in a camp. Considering the fate of the children, women and men, who must try to survive in the camps, makes me very sad, but my sadness does little to help them. They are clearly some of the people most in need of assistance. For some time now I have wondered, how could I help the people who are forced to live, for either a short time or a long time, in refugee camps?

Refugee camps are not really in the mainstream. The really grim ones are long-term affairs that are often hidden away in extremely remote areas of the world. Few tourists or even journalists make it to these areas and it is only the strongest and most courageous of development workers (or the most naïve) who take on such tasks. The conditions are extremely dangerous. The logistics of how to provide clean water, food, shelter, health care and energy in a temporary camp are daunting. There is always the chance of particularly savage contagious disease sweeping through the camp. Often the violent events that caused the people to flee in the first place continue nearby, threatening to come right into the camps, and often providing a steadily growing stream of more refugees.

Contemplating how to help has made me analyze what are the main problems with the camps. First it is important to know that the host governments are acting from necessity. They do not actually wish to have the camps, they are reacting to events and are forced to accept them or watch the people die. Often, host governments are urged by international institutions seeking to address the plight of the refugees, and generally, when sufficient donors can be found to pay the costs, then the host governments will agree to house the camps. The hosts want the refugees to return to their homes as soon as it is possible. Usually the hosts insist that no permanent facilities be built that would lead to permanent settlement of the refugees. This generally means that the camps are huge tent cities with either tents for individual families or larger tents for multiple families.

The ban on permanent facilities practically can mean that hundreds of millions of people live without sanitation facilities, usually having only trench latrines. Given the transmission route for many serious diseases is feces to mouth, it is not surprising to note the incidence of diarrhea and even cholera are found in the camps and that mortality rates are often higher than in normal conditions. The people walking through the camps trample the soil, without vegetation the compacted soil doesn't infiltrate rainfall. When it rains the camps can become muddy quagmires. The lack of sanitation facilities also complicates the delivery of clean water. If the water is coming from streams or wells it is often contaminated and if the water is trucked in it is difficult to keep the transmission equipment clean.

Another complication is cooking. Often the people are given small amounts of food that are distributed to families (when the family units are intact). Then each family returns to their tent to cook the food and feed the family. In order to cook, each family needs a fire. Often the people fan out into the surrounding areas and cut trees or brush denuding large areas of trees and vegetation. This in turn leads to increased danger of floods and mudslides. And when all the families are cooking can lead to air pollution problems with so many fires concentrated in one area.

As I look around at the stainless steel kitchen facilities here in the apartment where I am staying it is hard to imagine the misery of trying to cook in the camps. And I know that there is a toilet, a shower and clean water to drink and hot water in which to bathe. How different and how fortunate some people are and how tragic that some must endure such degraded and degrading conditions.

This makes me a bit angry. Why is the situation like this? What can be done? Having been a journalist earlier in my life, I know that there are some terribly unfair and quite appalling struggles going on in the world. I also know that many of these are beyond my ability to influence. They have nothing to do with me and I have no way to change them. But if I consider the conditions in the refugee camps I have to say that I don't think they have to be the way they are and that perhaps there is something that I can do to help to change them.

It seems to me that if you strip away the politics and the suffering in the camps, you are left with a design problem. To greatly improve the camps you need to provide several services without building permanent facilities. Specifically, you need to ensure sanitation, energy for cooking, and clean water, and you need to use temporary mobile units, so that when the conditions, which first caused the refugees to flee, are resolved, you can move the facilities to another camp where they are needed. Expressed this way, I know how to help.

The solution that I see for this logistic problem is a series of specially adapted containers that travel like all containers on flat bed trailer trucks and can be moved to any location as required. These containers are specialized but all fit together to make a system. First depending on the number of people you have a certain number of toilet containers, this can go up and down with the number of the people in the camp. These can be placed at compass points for greatest convenience. You can have men on one side and women on the other to ensure modesty and convenience. The toilets should be vacuum collection (similar to the toilets in airplanes and their waste should be collected through small diameter vacuum pipes into a second type specialized container. This second container is essentially a mobile methane digester. This unit takes biological material and microbes using anaerobic digestion convert the material into two different outputs, one is CH₄ (methane) and the other is the digested material that can be further processed to make organic fertilizer. Additional specialized containers for gas storage are required in order to store the CH₄ that comes from the digester. You would also have to process the digested solid material once more in an aerobic process by adding vegetable waste or cellulosic materials and having worms eat the materials. All of these units can be at the periphery of the camp.

The gas storage container(s) could then be connected to two different specialized containers. One of these would be a community kitchen(s) with gas stoves that can be used by all the various families. These could be placed in the center of the camp and the optimal number of these would be determined. Families could cook their meals and then carry them back to their tents using the re-usable stainless steel nesting lunch containers used all over Asia.

The other use for the gas would be generation of electricity from a specialized container containing a natural gas run electric generator. This could provide lighting, computer / communication services – allowing the camp management to better administrate and also allowing education facilities in specially designed reference and research containers and to provide power for health and administrative services.

The use of such a system would ensure sanitation, protect water supplies, and provide energy for cooking and electricity while protecting the vegetation cover surrounding the camp. It can also provide educational opportunity by making computing and communications available to the refugees. The system could also provide employment opportunity to many of the refugees who could be employed to help keep the system clean and working under the direction of technicians. Finally, this system could be moved to another camp when the crisis was over and it was no longer needed at the original location.

This would seem to meet the criteria set for refugee camps and would greatly improve the conditions. Ideally these units would be manufactured in the developing world near where they are needed, thus giving people jobs and improving the conditions.

I've been walking around with this in my mind for a while and felt that it might be more useful if I wrote it down. This seems like a very useful line of inquiry and I'd be very interested to discuss this with anyone who would like to participate in making this a reality.

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Above is a satellite Image of a refugee camp in Chad, showing lasting damage to the vegetation cover surrounding the camp. The solution outlined in this essay could help camps like this as better accommodate the refugees without this type of damage and could be moved to other camps when/if the conflict that displaced these people ended.

The United Nations High Commissioner for Refugees:
<http://www.unhcr.org/cgi-bin/texis/vtx/home>