

DESIGN OF REFUGEE SETTLEMENTS: DEVELOPING ECOLOGY-DRIVEN APPROACH

Philip Amstislavski*

School of Architecture, Rensselaer Polytechnic Institute, Troy, NY

Abstract

Fast developing refugee crises can cause a massive environmental impact. It is often a consequence of rapidly increasing displaced population compounded by poor camp planning and logistical decisions. Environmental deterioration of surrounding environment in turn generates impacts on the refugees and local populations. In absence of mitigating measures, the economic, social, and public health impacts on these populations can be devastating. International humanitarian relief system has been slow to find effective measures to balance relief and environmental action in refugee crises. This is a result of the lack of a systemic approach that combines local and outside resources to facilitate long-term environmental sustainability.

In the midst of humanitarian crises, ecological issues are often disregarded due to the lack of information and resources available to the aid workers in the field. Use of renewable energy and materials in construction and operation of the camps is seldom considered. Local inhabitants and refugees are rarely included as partners in relief action, in decisions affecting their livelihood and local ecosystems. Left dependent on outside aid, refugees often cannot sustain themselves when the aid is withdrawn. There is an urgent need for designing and applying sustainable strategies to both emerging and existing refugee populations.

The following discussion addresses the current camp planning strategy applicable across geographic and political domains. It examines a proposed model for the integration of existing aid work experience and expertise in the fields of environmental sciences as well as information technology, engineering, and architecture to resolve current impasse facing many refugee communities and their hosts.

Carrying capacity; ecology; eco-cycles approach; environmental action; internally displaced persons; man-made load; participatory design; optimization; refugees; renewable energy; sustainable development.

* Corresponding author: Greene Building, School of Architecture, Rensselaer Polytechnic Institute, Troy, NY 12180; email: amstip@rpi.edu

REFUGEE CRISIS AND ENVIRONMENT: A BOOMERANG EFFECT

Field experience shows that rapidly developing refugee crises can produce massive environmental impacts that ripple over the physical domain of the displaced population and its host region. This is often a consequence of a rapid increase in the camp population, compounded by poor prior assessment and logistical decisions. Boomerang effects of a damaged habitat generate impact on the refugees and the local populations. In the absence of mitigating measures, economic, social, health and cultural impacts can be devastating.

Due to the lack of better tools, relief groups rely almost entirely on field experience in addressing environmental issues. At this point the overwhelming priority of relief efforts is saving lives and there is little time to address longer-term issues such as future impact on environment and sustainability. Use of locally available renewable energy sources and environmentally sound design approaches in the construction and operation of camps seldom influence the criteria that inform the design of camp environments.

From the onset of a crisis, refugees typically become passive recipients of outside resources. They often remain in this position for many years if repatriation or resettlement is not viable options. In later stages there is increasing difficulty in promoting independence of these communities, as the mechanism of self-reliance was not established on the onset. This renders many refugee settlements almost totally dependent on international aid agencies and host communities to meet their energy, shelter and food needs. Such dependence has far-reaching consequences in the normalization of the lives of refugees and their reintegration into a stable social environment. Dire living conditions and unemployment also create feelings of worthlessness among the exiles.

REGIONAL ECOLOGICAL IMPACT

Self-reliance has to be integrated into planning from the onset of the crisis. Field experience demonstrates that programs, which empower refugee populations to develop sustainable farming, housing, and energy producing practices help avoid expensive environmental rehabilitation projects and can produce local employment. Such programs foster feelings of self-worth among traumatized exiles and transform a chaotic settlement into a community that possesses knowledge and skills that will benefit both refugees and environment. (UNHCR, Environmental Demonstration Projects, 2000).

A backdrop to life in a refugee camp is the gradually decreasing amount of incoming aid and resources from relief groups, which quickly move on to the next humanitarian crisis once there is some stabilization in the camp size and the security situation. Sometimes mounting tension between local population and the refugees exacerbates this situation. Competition between locals and refugees for insufficient resources (firewood, fodder, and water) can create conflicts and damage traditional

and sustainable local system of resource management. During the author's service in the Balkans he witnessed one such situation: in the winter and spring months of 1999, Kukes, a small impoverished town in northern Albania with a population of 25,000 absorbed more than 100,000 Kosovo-Albanian refugees fleeing the war. Such a massive increase in population quickly overwhelmed local water, fuel, and healthcare resources. Local residents were deprived of firewood and fodder for their livestock, as tents covered many pastures. Scarcity of firewood for heating and cooking also forced women and children to spend long hours looking for firewood far from the camp. This exposed them to assaults and cold weather conditions. By the time of the refugees' return to Kosovo serious damage was caused to the traditional local system of resource management and the indigenous forest, which served a primary source of firewood, building material, and feed for livestock.

CURRENT STATE: LACK OF INTEGRATION

Throughout the world, almost 23 million people live in refugee camps and more people are displaced every year than ever before (UNHCR, Environmental Guidelines, 1996 ed.). Although the most hoped for solution to the refugee crisis is repatriation, settlement in a third country and local settlement are common alternatives. The latter option often involves the restructuring of a refugee camp into a long-term settlement. However, if this possibility was not envisioned at the onset of the crisis a site may lack the capacity to serve as a basis for a long-term settlement.

The old model of response to the humanitarian crisis is outdated due to the evolving nature of situations that create displaced communities. The source of the problem, increasingly, is internal conflicts, in which Western governments intervene. This created the new framework in which the old crisis response model is increasingly failing to alleviate suffering, provide economic and social stability to affected regions and prevent environmental damage. The last point is in particular poorly addressed by aid groups, since there is no systematic approach to provide reliable data and expertise to assist in the decision making process in the field. Although it is commonly understood that ecological issues are linked to the future sustainability of displaced communities, at present there is no coordinated effort to incorporate sustainability agenda into all three phases of relief work (emergency, care-and-maintenance, and durable solutions phases as categorized by UNHCR).

Inclusion of sustainability into relief efforts can reduce costs of the rehabilitation, educate refugees about environmentally sound practices, and assist their reintegration into stable social environment. The time is ripe for a new approach that will integrate settlement ecology into a larger regional ecosystem. Such practices can be broken into three sequential phases according to the three stages of humanitarian crisis:

Emergency stage

From the onset of the crisis (the emergency phase according to UNHCR) shelter, food and a safe haven for refugees are the priority in order to minimize loss of life. However, maintaining an often-fragile balance within local ecology is also a crucial issue. As discussed further, impending crises can be identified before they erupt, suggesting that it should be possible to assess applicable sustainable practices for each crisis so that they can begin as early as the field conditions permit, even prior to arrival of refugees. Currently, this is not a standard practice, indeed it is a rare exemption that local ecology and self-reliance are thought of at this stage.

Maintenance stage

Once refugee camps become established and routines of food, water, energy supply, and waste disposal are set in place, it becomes increasingly difficult to apply sustainability agenda to the by then existing infrastructure. It is also important to note that social contracts and behaviors established during the emergency phase are of utmost importance. Once set, these patterns are not easily changed and it is crucial to establish an understanding of the camp's sustainability agenda among the refugees as well as among the relief workers throughout the humanitarian action system. The educational agenda must become a crucial part of relief efforts. Success of practices of permaculture and community forestry, renewable energy production and other catalytic actions will rely heavily on the education of end users (refugees and people living around and adjacent to refugee camps/settlements) and aid workers.

The catalytic nature of sustainable development of these activities may require substantial initial investments in equipment, technology, and training of the refugees and aid workers in the field. However, these investments can prove to be money well spent in terms of long-term development. Little research has been done so far in assessing the benefits of such practice as compared with traditional rehabilitation techniques used by international humanitarian relief system. There are no refugee settlements developed using such an agenda from the onset of a crisis. It is crucial to test these principles in the field. Comparative analysis would be important in understanding how such an ecology-driven approach can work in terms of both displaced communities' rehabilitation and the maintenance of environmental quality in diverse geographic and social domains in which the refugees are present.

Durable solutions stage

In the durable solutions phase of response there is an established relationship between rehabilitation strategy and long-term development. For sustainable development to be successful refugee camp design should be site-specific and have a high degree of refugee and local population involvement. Examples of such participation include the use of local sustainable farming and building techniques and adaptation of traditional skills to produce new environmentally friendly

commodities (such as production of solar cookers and self-composting toilets). There are particular logistical, economic, public health, and environmental strategies that can promote sustainability in the particular crisis situation and be more economically viable. Unfortunately, there is no established way to collect/share information on sustainable development in refugee settlements. There is very poor communication among the potentially bewildering numbers of relief groups, national and International NGO's (Non-Governmental Organizations) and various UN offices.

As a result, the decisions offered to refugee communities rarely rely on thorough assessment of community (refugees and local people) and natural resources of the area or use of previously learned lessons from similar circumstances in other areas.

REFUGEES AND INTERNALLY DISPLACED PERSONS

Increased spending will be needed to repair the environmental damage caused by refugee crises in the years to come. For example, rehabilitation of the areas of refugee camps in Africa alone could cost as much as US\$150 million a year (www.UNHCR.org). It will be even more difficult to rehabilitate the refugee populations that are either completely dependent on outside aid or left to survive on total a self-help basis for prolonged time without proper support. A more detailed examination of both these scenarios follows:

Refugee camps: reliance on imported resources

The first group usually consists of new refugees that are in emergency or maintenance stages of crisis. Since UN agencies and NGO's commonly take a reactive approach in the emergency stage of a crisis there is little attempt to think ahead and address ecological consequences of today's actions in terms of environmental impact and economic effects on local and refugee populations.

Little literature exists on the relationship between social-economic status of refugees and environmental action (or lack of such) taken. Various initiatives by UN, notably quick-impact programs (QIP's) introduced in Cambodia and Guatemala only target parts of the issue. (Helton 2002). Tangible benefits to refugees can be achieved by linking such matters as education, employment and health to regenerative energy production, clean water supply and sustainable local agriculture practices (UNHCR, Engineering and Environmental Services Section, 2000.). The funds conserved due to greater independence of these communities from donor countries can be redirected to provide continuing support throughout all stages of the crisis and reintegration back into the region of origin or into the local settlement program depending on the plan of action chosen.

Internally displaced populations: forced self-reliance

This second group includes all displaced populations that do not fall under the narrow UN definition of the refugee status. Under this definition the relief is provided

mainly to the uprooted populations that crossed national borders. The old distinction between externally and internally displaced persons or IDP's fails to acknowledge that tens of millions of people are displaced within their home countries. Recent examples are Balkan region, Indonesia, Afghanistan and other countries with large numbers of internally displaced persons. Unlike with refugees no single international organization has a mandate to protect IDP's and assists in their rehabilitation. Perhaps due to their undefined status, internal exiles receive little assistance as compared with refugees. They are commonly overlooked by the relief groups and are forced to exist mostly on self-reliance. These groups are forced to survive in often-difficult conditions and often find that low-impact solutions such as sustenance farming, wild grasses harvesting and recycling of older structures for housing provide some degree of self-sufficiency. Indeed, the international relief community has valuable lessons to learn from IDP's settlements. However, in most cases people simply do their best to survive and there is little consideration given to the environment.

There is also a crucial time factor in currently existing refugee camps. Even if the existing international humanitarian response system could somehow facilitate better handling of environmental issues in the future it would be too late for many of these communities - environmental degradation can be irreversible in many regions.

ECOLOGICAL THINKING VS. TRADITIONAL RELIEF METHODS: ECO-BRIDGE

Complexity of rehabilitation is often intensified by some degree of environmental degradation of the area that existed even before arrival of refugees. Ecologically unsound design of the refugee camps only adds to such degradation. As I already mentioned, in such circumstances tensions build up between the local and refugee populations, resentment is common among the locals. In the most extreme examples, governments refused to accept or even deported refugees due to the anticipated environmental and social degradation these communities may cause. In December 1990, UNHCR estimated that there were 3.3 million Afghan refugees living in Pakistan. Overburdened local authorities pressured the refugees to leave and even deported some. More than half of this population eventually left; there are 1.5 million Afghan refugees currently living in Pakistan (Henlon, 2002). The Afghan-Pakistani border is currently sealed to the refugees from Afghanistan.

There is a clear incentive for the international humanitarian relief community to prevent new tensions, decrease environmental impact, and find more adequate solutions for future refugees.

However, the gap between widely practiced approach of simply providing food and shelter to displaced people and one that meets the refugees' needs but also promotes self-sustaining, more independent communities is not easily reconcilable. In terms of experimentation with completely autonomous existence, valuable lessons can be learned from Biosphere 2 project in Arizona. The facility's much-publicized original efforts of the 1990s aimed to provide a self-sustaining environment for

humans, in part as an experimental precursor to colonizing space. Biosphere 2 showed that such closed ecology requires immense amounts of outside resources and that the ecosystem remains extremely vulnerable if the inflow of outside resources ceases, even briefly. With an annual operating budget of about \$17 million, much of it in energy bills, Biosphere 2 can hardly be a model environment for a sustainable and self-sufficient refugee community.

European planned ecological communities in the last two decades have been envisioned to function in a way that is close to natural ecosystems. This framework is often called the ecocycles approach (Rogers, 1997). An extension of this view to a displaced community is to appreciate that it too is ultimately composed of complex flows of inputs and outputs - of energy and resources flowing in and wastes flowing out. By balancing inputs and outputs and recycling these resources within a community we can achieve a more viable settlement while decreasing its environmental footprint. Many sustainability-minded European communities such as the Fredensgade ecological housing development in Kolding, Denmark demonstrate successes in this field (Beatley, 2000). These examples provide valuable experience and technical expertise in use regenerative energy resources: photovoltaic (solar) trackers for housing, wind turbines, systems for recycling of organic wastes to be used as fertilizer, biogas and other clean fuels for electricity generation, food preparation and heating comprise an incomplete list. However, most of this experience is not transferable to the developing world and particularly to the areas of humanitarian crisis. Cost, unavailability of materials, and lack of infrastructure are all cited as major deterring factors to integration of environmental and social agenda into displaced communities. In contrast to European sustainable development, sustainability of refugee communities is contingent upon the wise use of scarce resources employing revolutionary new technologies in tandem with sustainable traditional practices while operating on very tight budgets.

Integration of organizational and design issues is unique in this context since the environmental and social agenda in the post-disaster settlements have to be developed simultaneously. The key issue is development and implementation of a systemic approach that will combine local and outside resources to facilitate long-term rehabilitation.

A major breakthrough in such integration would be the establishment of an international sustainability research center. Such a group, let's call it ECO-BRIDGE, will serve to improve international disaster relief system. ECO-BRIDGE would not be a passive collection of experts in disjointed areas but would promote proactive preventive action and secure a better future for all displaced persons while preventing environmental degradation.

How would ECO-BRIDGE work? It would have a comprehensive research capacity to ensure that best practices in the field are developed and applied. In responding to refugee crises, small teams of experts would form think tanks around particular refugee crisis situations. They would be able to establish firm working connections

with all players of the humanitarian action system: from the end users (displaced people in the field and local inhabitants), recipient governments to all branches of UNHCR and NGO's involved in the relief work, and ending with donor governments. The involved donor governments would ultimately fund such quick response teams. ECO-BRIDGE would be a leader in research and scholarship in the sphere of sustainability for displaced populations in the developing world. Obviously, the political independence of ECO-BRIDGE is crucial for its legitimacy as such a leader.

The following discussion of ECO-BRIDGE demonstrates how such an organization would work for the refugees' cause while simultaneously advancing important issues of sustainability (see figure 1).

Preventive action

ECO-BRIDGE would identify impending crises before they erupt and provide comprehensive assessment measures to prevent displacement of populations. In cases where the exodus of refugees is imminent, the center would assess the areas of future camps and make recommendations to relief groups.

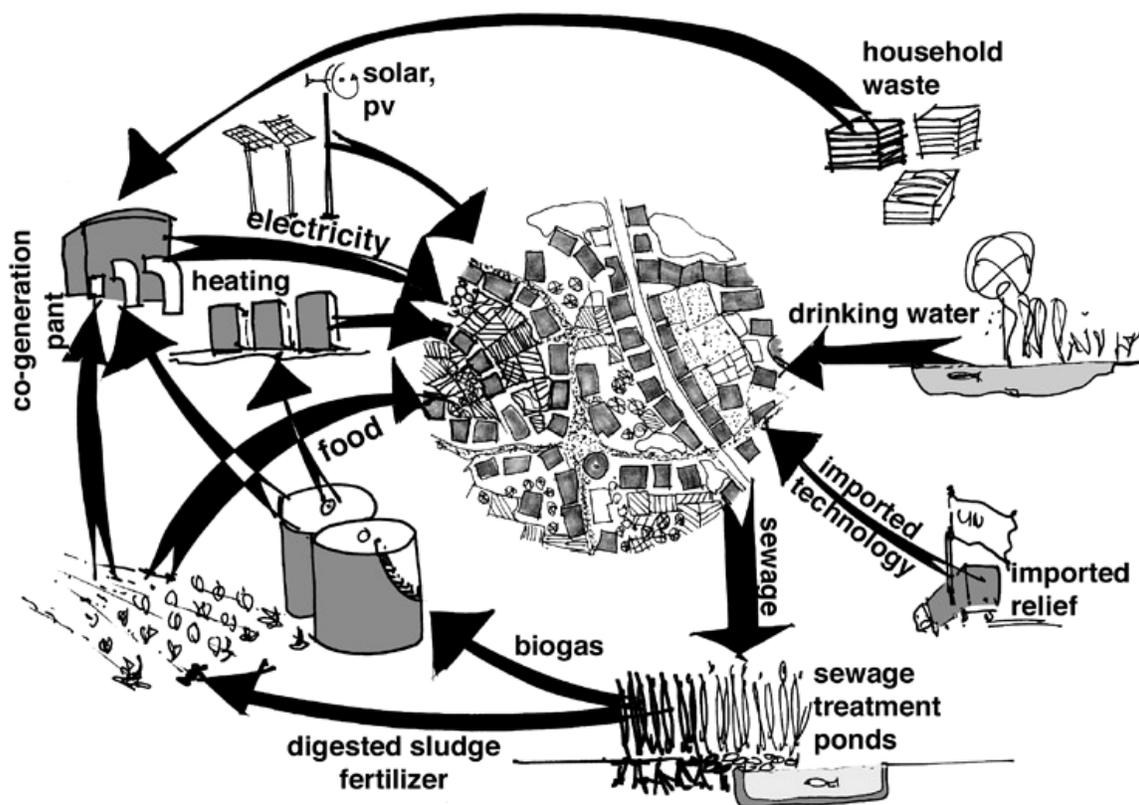


Figure 1: integration of local ecology, community resources and imported technology in refugee camp design

Early assessment

Based on an accepted set of criteria, such as UNHCR's Environmental Guidelines (1996), the environmental data should provide the following information on the perspective camp location areas: topography; geology; hydrology; vegetation/forest cover; soils; local climatic conditions; and proximity of fragile areas.

Additionally, the following data would be needed regarding the human factor: local population's social-economic conditions (including traditional farming, natural resources management); energy supply; infrastructure; displaced populations' traditional housing forms and construction; displaced populations' farming skills, techniques and forms of resource management.

This list would be customized with details specific to the particular area and demography (both refugees and local people). An example of such a match between local natural and human resources can be the use of building-integrated photovoltaic (BIPV) panels, a system of solar panels that generates electricity. BIPV's is an off-grid system (independent of electrical grid) that is capable of producing much-needed electricity, which can be used in lighting and telecommunications. The choice of such system would be subject to initial assessment criteria: a favorable location of the camp which implies that the layout faces south and the geographic location has sufficient solar irradiation or sunshine. The refugees and local people would require skills and motivation to benefit from such system: tasks that ECO-BRIDGE can meet through a training program. Camp residents would ultimately be responsible for the installation, maintenance, and repair of BIPV's. If such a system proves to be successful, there is a potential that local production of this environment-friendly technology will eventually result (see figure 2).

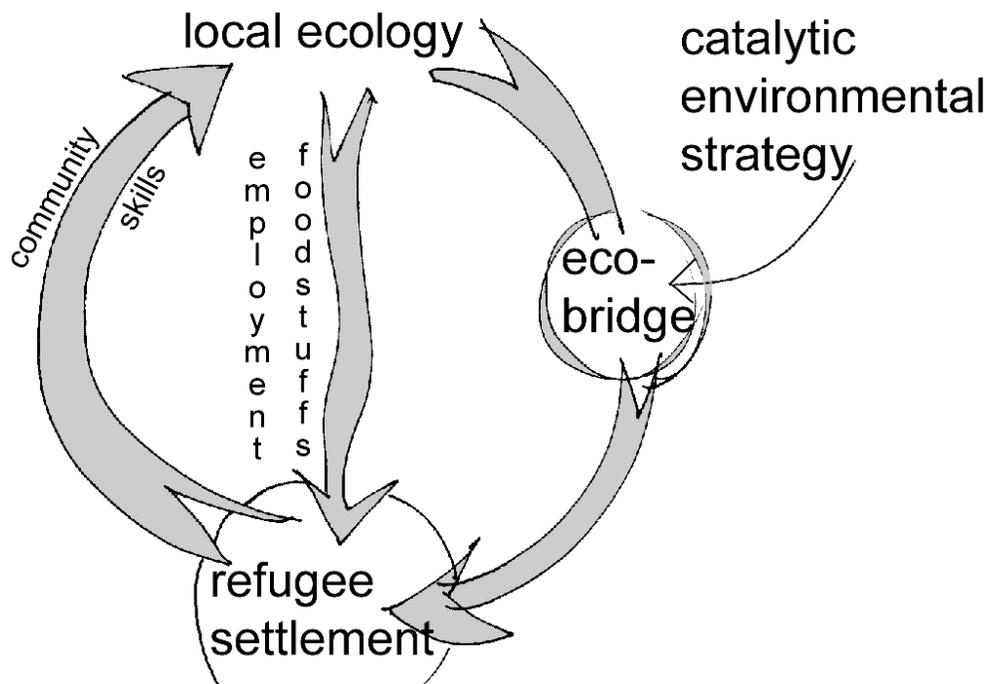


Figure 2 : environment-community interaction

Liaison and education role

Once the basic needs of the refugees are met, work with community leaders (refugees and local people) and responsible governmental and relief groups to implement long-term sustainability agenda will become the primary focus of ECO-BRIDGE.

Technical expertise

ECO-BRIDGE would provide end users and relief agencies with recommendations on best practices in the fields of renewable energy, traditional forms of sustainable farming, regenerative energy sources, sustainable community design practices such as community forestry, wild grasses harvesting, and permaculture. Their input in use of both imported and local materials, skills and resources would assist adequate community planning while decreasing negative environmental effects.

Global resource center

An extensive Internet-based databank in sustainable community design applicable for developing world will be created as ECO-BRIDGE responds to crises. There is already a demand for such a resource center since existing data on sustainable development is mostly limited to Western European countries, the USA, and Japan. The economic gap between developing world and these countries renders much of this experience not transferable due to high the costs.

ECO-BRIDGE's experts in the fields of ecology, behavioral psychology, architecture, engineering, forestry, and agriculture would be able to work directly with refugees and local inhabitants as well as relief agencies to address all stages of a refugee crisis. For example, recommendations on choice of camp site would adhere to core requirements for shelter, food, and drinking water as well as for sustainability considerations (low environmental impact by means of using renewable energy, recycling of wastes, community forestry, permaculture, etc).

Although some relief agencies can object that they are already doing a portion of such work, there is no organization that can quickly and efficiently respond to the full spectrum of environmental issues in a humanitarian crisis. ECO-BRIDGE would be a small group of experts not weighed down by heavy bureaucratic machinery that would work directly with the refugees, responsible agencies, and local governments.

ECO-BRIDGE's priority will focus on transfer of the lead role to end users: any skills that people adopted while in exile should be capable of being transferable (in the case of skills learned and adapted) or transported (in cases of technologies and building systems) with them if and when they return home. Experience shows that when people thoroughly understand the rationale behind sustainability they are more likely to apply its principles in their communities. Such catalytic action would be a core goal of ECO-BRIDGE (see figure 3).

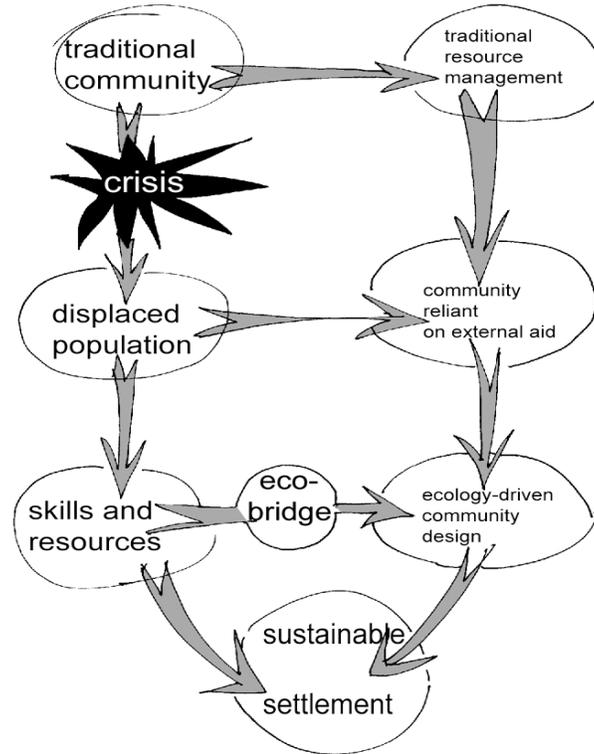


Figure 3: ecology-driven approach in existing refugee camps

OUTLOOK

Albeit the event of exile is tragic and extremely traumatic for the refugees, refugee camps can be seen as an opportunity to create self-sustaining, and ecologically viable settlements. Ecology-driven approaches to their design can help provide opportunities for employment and the acquisition of new skills, and assist in the rehabilitation of the devastated communities while reducing their environmental footprint. Creation of a cross-disciplinary think tank such as ECO-BRIDGE, which compounds field experience with logistical and scientific expertise, would be a major step in achieving such a goal.

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