Reuse emergency housing in the reconstruction of host region

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Abstract. The research tackles the issue of using sites, which have been designed as camps for (internal displacement people (IDP)), in the reconstruction of the host region and their role in the development of cities. The research explores the potentials of camps as a driver of urban transformation in the urban fringe of Erbil- Iraq. The study also investigates the impact of some factors such as timing, nature, the nature of development, motives of urban transformation, the size of the camps, their regional organization, the nature of the population and their religious affiliation, on the potential of transformation. The research sheds the light on the transformation of the temporary housing structure into a permanent structure and its effect on the structural urban features of the city.

1. Introduction
The crises that occurred in our country, resulted from the wars and conflicts, led to a sudden loss of security, privacy and deterioration in terms of health, psychology and education. This has led to the displacement of large numbers of people from their houses (Internal Displacement People (IDP)). Those (IDP) have found themselves living temporarily in camps. They hoped that these camps will provide them with shelter and basic requirements for living in dignity. However, the unorganized response had given a negative impact upon the displaced population and the host community in social, economic and environmental aspects. Consequently, this caused a waste of resources and funds.

In this research, the reasons behind selecting a camp site is to include the camps in the planning process of the master plan in order to enhance or improve future development plans.

2. Recovery process after disasters and crises
Communities, non-governmental organizations and Governments usually respond immediately after a disaster with a process that begins with the relief and ends with the recovery in order to return to normalcy. The humanitarian response therefore, lasts from a few days or weeks to several months and even years. The response are generally included the provision of adequate shelters, infrastructures and decent living opportunities for the victims. Temporary housing is usually used when people are unable to rebuild or use their original homes. There are many options regarding the building system, location, and treatment. These have their advantages and disadvantages. Therefore, it is necessary to assess appropriate solution, in order to meet short-, medium- and long-term needs.
2.1. Classification of accommodation options after disaster

Table 1. The six settlement options for displaced populations [1].

| Options                  | Definition                                                                 |
|--------------------------|---------------------------------------------------------------------------|
| Host families            | Local families shelter the affected people in their households or their properties. |
| Urban self-settlement    | Displaced populations use unclaimed urban properties, or land unaffected by the disaster, informally. |
| Rural self-settlement    | Effected people create a settlement on collectively owned rural land.       |
| Collective centers settlement | Existing large structures, such as mosques, schools, and Stadium, can serve as collective shelters. |
| Self-settled camps       | The displaced population, independent from government or international organization support, forms camps. |
| Planned camps            | Government or supported organizations plan camps, including infrastructure, in order to house the affected people. |

3. Planned camps

The definition of the camp is closely related to the definition of IDPs. The displaced person is the person lives in camp and the camp is the place where the displaced person lives.

Planning the camp can contribute to its transformation into a permanent settlement through the application of resettlement criteria. If a resettlement site turns into permanent settlements, social, physical, political and legal appropriateness will need to be taken into account.

The concept of durable solutions was emphasized in the Guiding Principles on Internal Displacement (Principles 28-30). In its national displacement policy, the Iraqi Government defines durable solutions as follows [2].

Permanent solutions are based on three elements: the first is long-term security, the second is the return and the compensation of lost property. The third solution is an environment that preserves the former life of the displaced under normal economic and social conditions.

- **Return**: This term is used to describe the person who returns to his or her natural or previous place of residence. Returnees are former migrants or refugees who have returned to their homes or natural place of residence.

- **Local integration**: This term is used to describe the process of stability of the former displaced person in the social, economic, cultural and political fabric of the host community.

- **Resettlement**: This term is used to describe the process of starting IDPs on a new life in a society that are not their original homes or places of residence or where they originally sought refuge.

3.1. Planning criteria

Corsellis and Vitale, discussed in their book, Camp Planning Guidelines [3], the following important criteria:

3.1.1. Site selection

Site selection is the main activity of planners, a process of gradual exclusion of inappropriate sites leading to the selection of the most appropriate site available. The criteria for selecting the site are: land ownership, location and access, topography, soil type, water source, site area, plant life and vegetation cover.

3.1.1.1. Land ownership

Land ownership is the first issue to determine whether the site is available for use. Government land, the land allocated to ministries, national parks and military lands are often available as they are in government hands and thus easier to be located.

3.1.1.2. Location and access

Camp planners must verify access to the site at all times throughout the year (as temporary camps often become long-term camps). Road access to the camp must be paved to make it suitable for all weather conditions. Bridges or crossings should be assessed in cases of high water level. Access to the site must be easy to ensure contact. Close to essential supplies such as food, cooking fuel, building materials, water and electricity, preferably close to national social services, especially health care. Access and location are important as they relate to economic opportunities and work outside the camp.

3.1.1.3. Topography

Prefer low-gradient locations on each of the sloping or flat sites. The flat site is quite difficult to discharge water. The steep sites, where the usable area is very small relative to the total area, is subject to rapid erosion. The site with (2%) sloop is ideal for setting up the camp as it does not interfere with the location of roads, housing and other facilities. The drainage systems are simple, operate with gravity and do not require large engineering inputs.

3.1.1.4. Soil type

Camp planners must understand the advantages and disadvantages of different soil types. Soil types affect health, daily logistics, and water drainage.

The most important of these is the ability to discharge water and the ability of the soil to absorb running excess water and sewage without polluting groundwater sources. In General, porous sandy soil is the best to deal with. Mud soil is less absorbent, more prone to flooding and tends to turn into a viscous solution when it is mixed with water. This sticky mud makes transportation, logistics and daily activities more difficult. Black cotton soils are particularly difficult to deal with, especially when the groundwater level is high. Rocky soils are the least productive soils, making sanitation work more difficult. The latrines cannot be dig out and even if they are built, they will serve as waste water tanks rather than cesspits.

3.1.1.5. Water source

It has been proven that providing enough water throughout the year is the most important criterion. The site should not be chosen on the assumption that water can be obtained by drilling wells or transporting. Drilling wells may not be feasible and may not provide sufficient water. Water is the basic element of the whole population in an emergency, regardless of the nature of the emergency as the daily activities are focused on bringing water for cooking, drinking and bathing. The appropriate location depends on the availability of a suitable source of water. Transporting the water by tank is not useful because it is expensive and depending on the distances from which the water is transferred, tanker transport consumes more than 80% of the total budget of the program.

Large clean water sources such as clean lakes and rivers are attractive as water can be taken and used immediately by the population without engineering or other logistical inputs. The unregulated use of surface water by the community is likely to contaminate the source. Planners should take into account implementing system for protection of water resources (Figure 1). Shallow water sources are also adequate if the output is sufficient for the population (the water quantity criterion is 20 liters per person per day, although in acute short-term emergencies, 5 liters / person is sufficient). Shallow wells are
attractive since they are engraved ready and can be fitted with hand pumps and other minor technological improvements, at the lowest cost. They are vulnerable to pollution from surface water resulting from community uses and direct contamination from latrines, if the groundwater level is very high (two meters from the bottom of the toilet pit).

Deep wells are good sources of water as they are high in capacity and relatively protected from direct surface contaminants. Deep wells require suitable pumping systems and other technological elements that may need some time to be fitted.

3.1.1.6. Site area

The size of the site to be used should be proportional to the size of the population to be accommodated. However, the size of the displaced population cannot be determined in early times of disaster or crises. The accepted standard among United Nations organizations is 30m² per person, include The area of shelter, roads, and administrative areas, with 3.5m² of roofed space per person. To determine the exact size requirements of the site, several factors must be identified:

- The number of residents who will be accommodated.
- Percentage of usable space to the unusable area of the proposed site.
- Type of shelter used.
- Shelter model and distribution plan on site.
- Future expansion needs.

The planners should take into account additional space for future expansion in case the camp is forced to absorb new displaced persons.

3.1.1.7. Plant life and vegetation

Vegetation-free sites are generally unsuitable for human communities. Natural trees, shrubs and vegetation should be protected when preparing the site plan. Public awareness campaigns should be implemented, fines and penalties imposed for those who abuse vegetation. Finally, fuel and building materials brought from areas far away. The need for fuel wood usually leads to a large, dusty area spreading out of the refugee camps very quickly, and with the destruction of the environment in this way, the lives of the refugees are also destroyed.

3.1.2. Site Planning (Camp Plan)

Factors to Consider in Site Planning

3.1.2.1. Start with the family unit

Site planning should begin with the characteristics and the needs of a single family of the population affected by the disaster as much as possible. Site planning begins by studying the distance from the family dwelling to the water and latrines, family relationships with other members of the community.
(relatives, clan or other ethnic groups), traditional habit and living arrangements. The development of small units, then expand the study to larger issues of the overall site plan gives better results than planning the site as a whole and then fragmented into smaller community units leaving the needs of the family to the end (Figure 2) [4].

4. Case study
There are two lines of reuse, first is the reuse of the material that has been used in the camps, such as shelters (tent, transitional shelter, and temporary shelter), public building (school, kids area, and community area), and material used in infrastructure. Second is the site that selected to build the camp on. In this research, we try to find the opportunity of reuse the site, as part of the city, this depends on its location, neighborhoods, and the function of the area in master plan.

3.1.2.2. Key facilities and services
Medical facilities, Schools, Warehouses, Distribution centres, Market places and commercial facilities, Provision for livestock, Communal washing facilities, Recreational facilities, Cemeteries, Religious/ritual facilities, Surface-water drainage, Refuse collection and disposal infrastructure.

4.1. Incorporating camps in the master planning process
The research addresses camps associated with the new areas undergoing development in urban areas and is part of a process related to the preparation of new land in the city’s master plan. These lands are often located in areas with poor access and lack of trade, cultural and recreational services. However, because of the size and scope of the camps associated with the size and nature of development activity, it is possible to introduce a new development logic based on the development of camps. The outline of the main city of Erbil for 2015 sets areas in urban fringe that will be developed into new growth centers. The process of transforming the camp into a form of housing is an effective strategy for improving the living conditions of the population.

The strategy involves the introduction of new economic activity and new institutional facilities such as schools, health care, training institutions, cultural institutions and public spaces in the camps to meet the needs of all displaced populations and existing settlements in the region. The organization of group activities in connection with a plan to intensify the mobility system is used to establish a central network that will organize movement and new relationships in the region. This also contributes to the creation of more flexible boundaries between the semi-public and public areas. This will play a role in establishing multidimensional relationships over time across different groups of users as camp activities evolve from a temporary state to a more permanent and strategically planned state. This will be achieved by through coordination between developers on one hand master and individual planner, on the other.
4.2. Baharka camp

The camp overview is shown in Table 2, and the site plan of Baharka camp is shown in Figure 3.

| Table 2. Baharka camp overview. |
|-------------------------------|
| Date opened                  | 10-06-14 |
| Planned capacity             | 997      |
| Population                   | 4164     |
| Number of households         | 877      |
| Occupied number              | 997      |
| Camp area                    | 283,165m²|

4.2.1. Site Selection

The site of the camp was chosen to be part of the developed area in Baharka, as it is located within the development area in the eighth Erbil master plan prepared by the Lebanese Company 2005-2030. (Erbil Integrated Development Planning) (Figure 4).
However, the site selection process was not successful, because the housing units that were built in, has collapsed. It was later found that the cause of the collapse was the nature of the soil (Figure 5). It is fragile and intolerable soil. Therefore, the camp administration and the organizations concerned were forced to extend the camp and add new areas for the resettlement of the affected people.

Figure 5. Destroyed houses in Baharka camp (by author).

4.2.2. Plant life and vegetation
The American Kurdish Cooperation Organization, with the support of the Diamond Companies Group, set up six greenhouses to grow vegetables inside the camp, located on the outskirts of Erbil (Figure 6). It was used to supply the camps part of its needs for vegetables.

Figure 6. Greenhouses (by author).

4.2.3. Shelter
Top two observed shelter types are tent on cement base, and caravan (Figure 7). (Table 3) shows the ratio of each in camp.
Table 3. Baharka camp overview.

| Type of shelter       | The ratio |
|-----------------------|-----------|
| Tent on cement base   | 82%       |
| Caravan               | 18%       |

4.2.3.1. Tent on cement base

Each family (6 people max) has a tent 5*3m, with toilet, bathroom and kitchen surrounded by a central courtyard (Figure 8). The residents themselves made modifications to the tent by adding a fence of materials inside the camp to achieve privacy. The nature of the cultural, religious and social population affects the nature of the camp. The field study proved that camp residents prefer to live in tents rather than caravans, despite the fact that the tents are not environmentally efficient (heat and sound insulation) relative to the caravan. Spatially with a semi-private space to perform daily activities (Figure 9,10).

Figure 7. Overview for the distribution of shelters, source (camp management).

Figure 8. Tent on cement base (by auther).

Figure 9. Layout of Single Block (Sector A, C, and E) [6].

Figure 10. Layout of Single Block (Sector B, D, and G) [6].
4.2.3.2. Caravan
Caravan dimension is 3*7m, have 2 rooms, bath, and kitchen. The families added some modifications to suit their daily needs, as many families added an entrance to the caravan for the purpose of achieving privacy (Figure 11).

![Figure 11. caravans in Baharka camp (by author).](image)

4.2.4. Plan key facilities and services
Public services such as schools, health centres and distribution centres are located on the eastern side of the site. The location of community services does not achieve the principle of equal opportunities as it was far from people lived in the western part of the camp.

4.2.4.1. Medical facilities
Health services are available on-site. Camp provided with a health center, medical clinics and a children's care center (Figure 12).

![Figure 12. Medical facilities in Baharka camp (by author)](image)

4.2.4.2. School
Camp has primary school and high school on-site (Figure 13).

![Figure 13. primary school on Baharka camp (by author).](image)

The camp has also provided with: Distribution centre, Football Field, Mosque (Figure 14), Community Centre (Figure 15), Women Legal Centre, Playground, Camp Management, and services (Generator, Water Tank, and Borehole).
Transforming the current camp design into a form of housing in the region, depends on the principle of integration. The process of spatial arrangement of the camp by introducing a hierarchy of public, semi-public and private spaces can not only create a better living environment in the camp but also enable better integration with surrounding areas.

Design strategy includes the distribution of units with a set of fixed and temporary elements to facilitate the gradual transformation of housing. The flexibility of the housing unit and the adaptability of the architectural typology contribute to the transformation process of new uses.

The rethinking of such spaces as seeds of urbanization opens up new possibilities for urbanization and more dynamic and comprehensive solutions to depleted resources. The process of legitimizing these exceptions through the integration of camps with an urban structure opens up new possibilities for the rapid and effective delivery of public services.

5. Conclusion

• The planning process that precedes the construction of the camp play an important role for future transformation, and second use.
• Principles such as site selection, area of the site, site surrounding, and the nature of the land use approved in the master plan of the city, is the key driver in determining the possibilities of future transformation.
• The redesign of camps enables a better integration of the displaced people with the city at multiple dimensions and levels, balancing the provision of a relatively small common area with better integration in the city through the new facilities provided in the camp. This is important in changing the situation of the IDP from a heavy burden on the society to an individual who enjoys rights and contributes to the social, cultural and economic life of the city.
• Considering camps as a basis for permanent housing can be an instrument to introduce some form of low-cost housing, and add diversity to existing housing patterns.

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