

## **Public services and Roads in Gaza Strip after the Last 22 days of the War on Gaza (Prepared by UNDP)**

### **Introduction:**

The war on the Gaza Strip during the last month was characterized by massive destruction to public as well as private buildings and housing units. The destruction is visible along the five governorates in the Gaza strip with notable concentration in the North Governorate, namely, Beit lahia and Jabalia as well as Gaza City. Accordingly, huge amount of concrete rubble was produced in scattered areas.

### **Facts for considerations**

During site visits carried out in the rapid as well as detailed survey of damage, it was noted that the rubble removal will face the following constraints:

- The rubble is a mixture of different building materials, furniture, equipments ..etc. More efforts are expected to be exerted in order to fulfill the task of rubble removal
- There are some multistoried buildings assessed to be unsafe require special technique and machines in order to complement its demolition without affecting adjoining existing buildings.
- The rubble is mixed with poisonous harmful materials such as white phosphorus, Asbestos and depleted Uranium that constitute hazard to health while dealing with it. Hence, special care and precautions should be realized while removing the rubble.
- The rubble embodies some valuable items to their owners that may complicate the sorting process. The owners might object the conventional way of dealing with the rubble and rather require more tactful handling which will constitute encumbrance to work activities.
- The rubble might include UXO's that can't be identified by the ordinary workers. Verification by specialist in that field is needed to assure secured methodology in handling the rubble.
- The quantity of the rubble is changing continuously because the owners or others are taking steel, aluminum , furniture, belongings and others and sometimes using loaders for that purpose.
- The removal of the rubble needs a new dump site that is not yet identified and need coordination with Land Authority.

### **Assessment of quantities process:**

Undp working teams distributed among Gaza governorate had conducted the solid waste assessment along with rapid assessment of damage. Ex-experience of UNDP technical rubble team was utilized in the calculation and the methodology of estimate for rubble quantities. Tables were formed and distributed for utilization by the survey team. Three factors were used for calculation of rubble weight in Tons which are: .7, 1.35 and 1.75 for one m2. These factors are based on calculating concrete weight for 100m2 along with various structural elements, stockpile 1m high and estimate of separate foundation respectively. The various quantities were compiled and multiplied by \$10/ ton to cover the cost of sorting and transportation to the dump site.

As a result of UNDP site survey, almost six hundred thousands (600,000) tones of concrete rubble are expected for collection. These quantities are distributed as follows:

<b>Area</b>	<b>Concrete Rubble (Tones)</b>
Gaza City	216571.4
North Area	158606
Middle Area	58850.4
Khanyounis	54068.7
Rafah	100541
<b>Total (Tones)</b>	<b>588637.5</b>