RECYCLING AND SCAVENGING OF SOLID WASTE ITEMS DURING ISRAELI SANCTION AS SURVIVING STRATEGY FOR POOR PALESTINIANS IN THE GAZA STRIP

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Abstract - The Gaza Strip has an area of 365 km^2 with 2 million people most of them are refugees living in poor and unhealthy conditions. The total solid waste generated in the Strip ranges between 1700-2000 tons everyday as the daily generation is 0.7-1 kg per capita per day. Due to the scarcity of land available for landfilling any means of reducing waste quantities is to be welcomed. The total MSW recycling is 74 ton/year out of 720,000 tons/year (a recycling rate 10.20 percent). Metals 114 tons, organic 469 tons, paper and card 617 tons, plastics 154 tons, glass 333 tons and cloth 622. Scavengers play an important, but usually unrecognized role in many SWM systems in the Palestinian cities, especially in recycling, as formal separation at source and selective waste collection scheme. Due to the current sanction imposed on the Gaza Strip following Hamas victory in the Palestinian election in February 2006, the international aid has been stopped, which badly affected almost all sectors of life in the Gaza Strip. In these hard circumstances, scavenging among poor communities has become a common phenomenon as a source of income as a surviving strategy for hardship cases. This paper argues that recycling and scavenging should be a wider spread practice especially in the Gaza Strip where the Palestinian are facing financial and economical constraints. The aim of this paper is to review recycling/scavenging initiatives and highlight lessons learned and identify critical gaps at the three central landfills in the Gaza Strip.

Key words - SWM, Recycling, Scavenging, Gaza Strip, Surviving Strategy

I. THE GAZA STRIP – A BRIEF OVERVIEW

The Gaza Strip has an area of only 365 km^2 with a total population of 2 million (MoH, 2015) which makes this area one of the most densely populated areas in the world (2,500 persons/km² in 2000). Its area is approximately 45 km², its width 5.7 kilometers in the North section and attaining a maximum of 12 km at the South. With the urbanization, cost of living became unaffordable to the residents, that 83.2% of the households only are owned, regarding that 32.8% of the population are under Poverty line, and the average income per family ranges from Euros 8 to 12 per day. The unemployment rate for the Gaza Strip is 65%, while 51% of the people live on less than USD 1 a day (PCBS, 2015). Economic conditions in the Gaza Strip have deteriorated substantially since 1993 due to political impediments. Complications such as closures imposed by Israeli government, and strict security control on the movement of people particularly labor and goods between the West Bank and the Gaza Strip in one side and with other countries in other side, were and still the main reasons of economic deterioration (Environmental Strategy 2014).

II. SOLID WASTE EXISTING SITUATION IN THE GAZA STRIP

2.1 Quantities and characteristics

An amount of 0.7-1 kg/capita/day is the daily generation of solid waste. So an amount of 1700-2000 ton is the total quantity being generated in the Gaza Strip. Most of the solid waste items are from recyclable materials although recycling and scavenging are being practiced on a random scale. Many scavengers were observed in Gaza, Deir El-Balah and Rafah landfills, they are working in an unhygienic environment. In addition, regulation, monitoring or even enforcement to regulate such work is not available (El-Hawi, 2002). Generally typical waste composition in the Gaza Strip is illustraed in Fig 1.

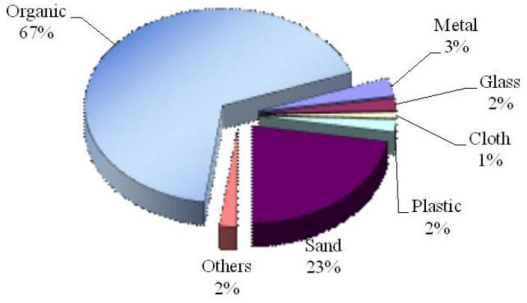


Figure 1: The Solid Waste Characteristics in the Gaza Strip ***(El-Hawi, 2014)***

Further estimates from different parties conclude that less than half of the waste generated in the households is actually collected and disposed of at the official landfills. This is because of the sanction imposed on Gaza 10 years ago associated with the cut of donor assistance including municipalities. The remaining waste is littering the roads, open spaces, beaches, wadis, and temporary and unofficial dumps. The general appearance of the Gaza Strip supports this estimate. This is considered a rather poor

performance. No system will collect 100% of the waste generated, but 70-90% overall collection efficiency in an urban area ought to be attainable. The prevalent collection system in the municipalities is the so-called communal system, where people bring their waste to municipal containers, mostly 0.8m³ capacities, which are placed along the streets or in other public areas. The containers are emptied into trucks with lifting cranes.

2.2 Scavenging Analysis

Scavenging is a livelihood activity that has to be considered in the context of the overall socio-economic conditions in cities villages. Scavengers recover recyclable materials from street bins, containers, communal collection sites, and final disposal sites. They sell these to dealers and thus indirectly provide local industries with recycled feedstock. Large-scale waste picking is a phenomenon that arises from the conjunction of absolute poverty with free (or very low cost) resources. Waste picking can be easily learnt and does not require literacy. Most waste pickers are poor, although they are not the poorest in the waste system and can earn up to three times the minimum wage (CID, 2001).

A common myth is that scavenging is the lowest paid work in the waste chain. Actually it is not many scavengers earn more than the minimum wage, up to three times (Yeny Dhokhikah* , Yulinah Trihadiningrum (2012). Often waste loaders and street sweepers earn less. Scavenging can be a way out of poverty for some poor families. It can provide women a chance to earn an independent income.

The reason that people engage in scavenging is often, because it is a job with low entry, as limited skills and hardly any capital are required. Some consider it a secure and predictable job, as waste is available year round, unlike work opportunities in farming. Some examples of reasons that children are involved in scavenging are already mentioned under 1.4: poverty/need for additional family income, low perceived value of education, high costs of education, absence of safety nets in communities, cultural factors and acceptance of child labor. Other reasons could prevail, depending on the local situation. (Calvo, 2007).

2.3 Attitude of Palestinian Authorities towards Recycling and Scavenging

One major characteristic of recyclers and scavengers, especially the ones who live near landfills is that most of them come from different areas and do not hold identity cards that prove residence where the landfills are located. Even though the areas near landfills are mostly properties belonging to private persons in certain areas of the Gaza Strip where the three central landfills are located. Scavengers build huts for themselves on these properties or the waste sites themselves and live there in order to be as close as possible to their source of activity that sustains them.

Despite the fact that the police show up quite rarely in the area where scavenging communities live and attempt to scare away people from the area of the landfill, the general attitude of authorities is mostly one of neglect towards scavengers. Their usual excuse for neglecting these communities is the high rate of unemployment and sanction imposed on Gaza since early February 2006 associated with cut in donor and aid assistance following Hamas won the election. For these reasons, the Palestinian Authority thus closes an eye on people illegally residing on the landfills. No measures are taken by the Palestinian Authority to regulate or organize. The majority of the scavengers found it unfeasible to depend on Palestinian Authority social to scavengers (100 Shekels/month currently which is approximately 30 Euro/month) that many scavengers find it more profitable working in landfill sites together with the family.

2.4 Disposal challenges, recycling and scavenging activities

The Gaza Strip suffers from a lack of convenient sites for sanitary landfills, and so any means of reducing waste quantities is to be welcomed (El-Hawi, 2004). The most common disposal practice in the Gaza Strip is dumping at landfill sites located around the city, which are generally uncontrolled dumps. One reason for this is the lack of landfill space in the cities. Often, sitting plans for potential landfills are strongly opposed by surrounding residents that causes complications; the case of the Solid Waste Management Council (SWMC) and the case of Gaza Municipality is a good example of this. Not in my back yard (NIMBY) syndrome is common phenomena in Gaza. Both have faced great problems securing land for extending the existing sites.

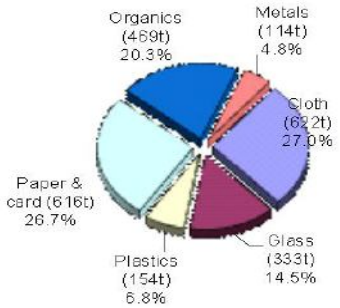


Figure 2: Estimated MSW recycling rates in the Gaza Strip (total 9068 ton)

Recycling of certain items from waste through some local people named scavengers represents an important strategy for poor populations throughout the Gaza Strip. An amount of 1700-2000 tons of Municipal Solid Waste (MSW) is the daily generation in the Gaza Strip, 40% out of this quantity in the

waste stream is made up of paper, glass, aluminum, scar iron and plastics (El-hawi, 2004) Figure 2.
Some of the small micro-enterprises working in the Gaza Strip as middlemen collecting scrap to be sold to Israel for US$ 30/ton. Paper and cartoon are being collected and reprocessed locally as egg pots and boxes (Personnel interview).

2.5 Reasons for engaging in scavenging and recycling

According to the 100 interviewed scavengers all over Gaza Strip, the major reason why they scavenge is the fact that they cannot find alternative employment (mainly due to their low level of education and income). Landfill operators and some social workers; however, do think that people who engage in scavenging do so as they are not comfortable with being controlled or having employment that involves fixed working hours. Scavenging, on the other hand, is an occupation that implies working whenever they feel like it, being able to stop and move around (travel within the area to places where scavenging is more profitable). Although different data was received with regard to the amount of income that people can make by scavenging, it seems that the likely sum that whole families make within a month is between 600-800 Shekels (120 to 170 Euros per month). Comparing this amount of money to the income one can receive from low-level jobs such as street cleaning or cleaning services and the minimum wage (1200 Shekels equivalent to 250 Euros per month), it can be concluded that scavenging and recycling indeed is a profitable activity in the Gaza Strip.

2.6 Palestinian strategies to lower the work risks of scavengers

Scavengers play a tremendous role, but usually unrecognized role in many SWM systems in the Gaza Strip, especially in recycling, as formal separation at source and selective waste collection are seldom well developed. No strategy could be identified that would have as a scope to lower the work-risk of scavengers. This is mainly the case as scavenging is considered to be an illegal activity, thus no one could be held responsible for any harm or damage that would occur to scavengers during their work.

The only measure that to a certain extent lowered the work-risk of scavengers was the hiring of the private security form that prevented access on the landfill during working hours in the three landfills of the Gaza Strip. Even though the intention was to keep away people so that the work of the operator would be more efficient, the result of this measure was that scavengers could not be on the landfill when the operator's trucks disposed of waste on the landfill. Prior to that, a number of accidents took place on the landfill that involved scavengers being run over by the landfill operator's trucks, and some of them were fatal. In the Gaza Strip no such measures were taken even though the number of accident is equally high on the Solid Waste Management Council (SWMC) landfill. According to the interview with the landfill operator, only this year two fatal accidents took place, one of them involved a child, while the other one an adult. The landfill operator's only measure taken is to report the trespassing of scavengers on the landfill occasionally to the police. According to the representative of the operator, however, the Palestinian police do not do anything, as there is a tacit understanding between police and operator that these reports are made only for the purpose of the operator being absolved of any blame for possible accidents.

III. METHODOLOGY AND DATA COLLECTION

Literature review on recycling/scavenging of MSW items, questionnaire, interview and interpretations with scavengers, street sweepers, municipal officials, private sectors, NGO's and SWM consultants were facilitated. Desk study and review of secondary resources as well as fieldwork, using a range of Participatory Rapid Appraisal (PRA) methods. Secondary resources included technical reports from SWM project documents, scientific articles and reports, articles in the press, project evaluations, filed survey, …..etc.

The fieldwork comprised the following methods:

- Semi-structured interviews and focus group discussions with resource persons and local consultants.
- Municipal officials, staff of landfill operators, UNRWA staff, scavengers, and children
- Observation
- Review of secondary resources
  - Resource persons included NGO practitioners, researchers in universities, and consultants.
  - Scavengers involved in collecting and recycling of certain items of solid waste.
  - In addition, semi-structured email and telephone interviews were conducted with key people involved in SWM in the Gaza Strip.

Some particular/specific questions focusing on:

- Recycling and scavenging as a source of income and surviving strategy during the current Israeli siege and sanction imposed on Gaza for 11 years;
- Willingness of local community to use recycled products;
- Recycling and scavenging as an environmentally disposal option and a means of saving resources,

- Relation of scavengers and recyclers with the local and Palestinian authorities.

IV. RESEARCH OBJECTIVE

The aim of this paper is to review recycling/scavenging activities and highlight lessons learned and identify critical gaps in the Gaza Strip. Also, to assess the environmental and hygienic conditions at scavenging areas. The following are the 4 key objectives:

- Review, understand and analysis recycling and scavenging and whether it responds to the market needs in Gaza;
- Assess public concern on recycling and scavenging and if they are willing to use recycled products;
- Assessment of the scavenging activities from the economic, legal, hygienic and institutional perspectives;
- Reaction of Palestinian Authority on the recycling and scavenging activities;
- Analysis of respondents/target group and interpretations regarding recycling and scavenging.

Target Group

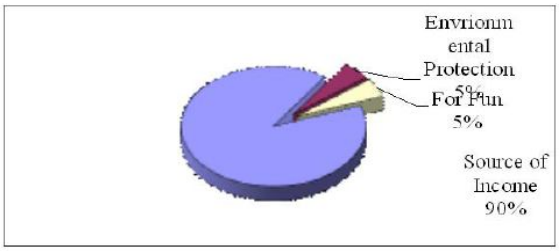
Target group has been selected as municipal officials (10), scavengers (100), NGO's (4), UNRWA (5), private sector (20), household (350) and decision-makers (3) categorized to fulfill:

- Those who work in SWM like local authorities, consultants and private sector;
- Those who involved in solid waste recycling and scavenging like municipalities, middlemen and dealers;
- Poor communities who depend on recycling and scavenging as a surviving means to cover their basic needs.

V. RESULTS AND INTERPRETATIONS

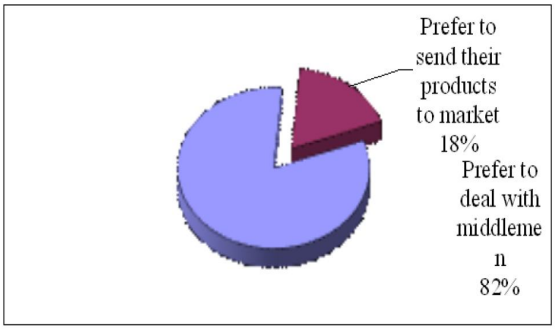
5.1 What scavenging means to you?

This question has been raised to 100 scavengers. Results of respondents were 90% responded that scavenging is a source of income and surviving strategy specially during the current Israeli siege imposed on Gaza for 11 years now, 5% for environmental protection and 5% just for fun as shown in Fig. 2



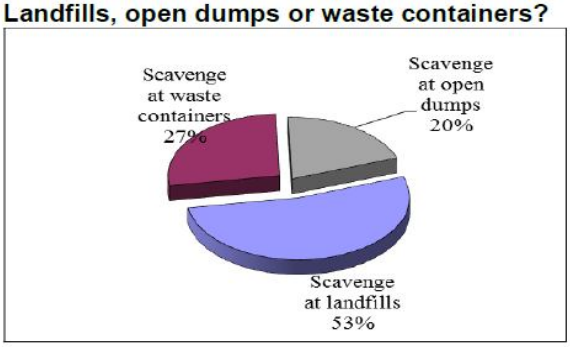
5.2 Do you prefer dealing with middlemen or traders to sell your recycled products?

This question has been raised to the 100-targted scavengers. Results were 82% responded that they prefer to deal with middlemen to sell their recycled products, they prefer not to get directly to the market. The other 18% prefer sending their products directly to the market.



5.3 Which areas do you prefer to scavenge? Landfills, open dumps or waste containers?

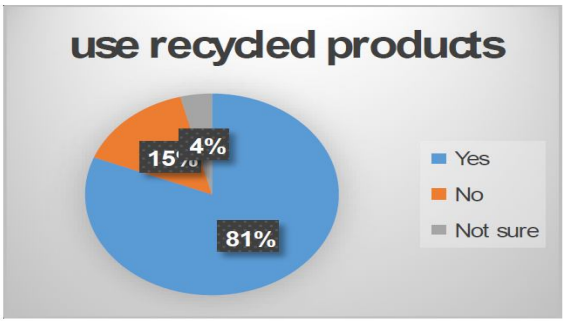
This question has been raised to the 100-targted scavengers. Results were 53% responded that they prefer to scavenge at landfills assuming that, much valuable items could be found there. While 27% find it much profitable scavenging in waste containers and 20% prefer to scavenge in open dumps.



5.4 Willingness to use recycled products

This question has been passed to the local community (350 members), Are you willing to use recycled products? What aspects favoring recycled products in the Gaza Strip?

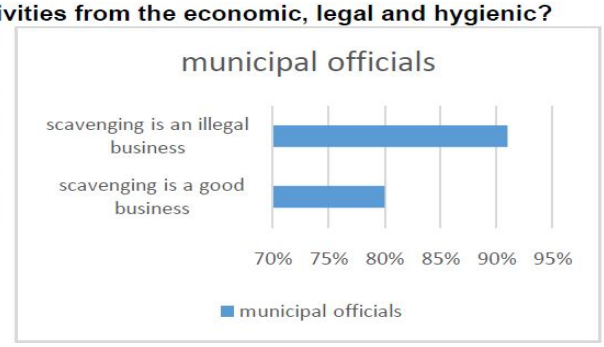
Respondents answered with yes (81%) indicating their willing to use the recycled products, assuming cheap price and accessibility all the time. 15% were reluctant to use recycled products for public health and Najas aspects. 4% responded that they are not quite sure.



High demand on recycled products among low and middle-income communities in the belief that, recycled products are cheaper than new ones (Household).

5.5 How do you assess the scavenging activities from the economic, legal and hygienic?

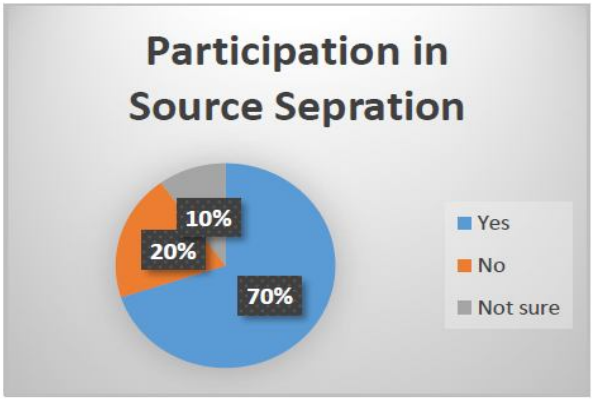
This question has been raised to the 15 municipal officials, local authority and private sector people. Results were 80% responded that, scavenging is a good business with proper tangible value. However, 91% responded that scavenging is an illegal business and carried out in unhygienic environment.



5.6 Willing to Start Source Separation

Are you willing to participate in source separation?

The public has responded positively by 70% willing to practice source separation, while 20% not ready and 10% were not sure. Fig.3. This can be explained by lack of awareness on source separation and no incentives from municipalities are provided to encourage the public to start source separation.



Its not worth spending time and effort sorting some items from the solid waste being generated in the Gaza Strip since less benefits and low market is existing for recycled materials (Street sweeper).

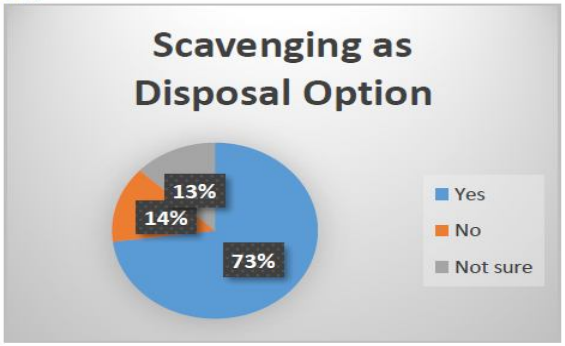
The public participation in source separation is an important for the success of any recycling program (Environmental NGO)

5.7 Recycling and Scavenging as Disposal Option

Do you see recycling as an environmentally sound disposal strategy of MSW?

This question has been raised to Ministry of Local Government, Ministry of Environmental Affairs, municipalities, village councils UNRWA, NGO's.

Respondents were 73% with yes option, while 14% with no option, and 13% were not sure as shown in Fig. 4.



Recycling and scavenging of SW items should be adopted as an environmentally sound disposal strategy parallel to landfilling since it saves collection and control of waste related diseases and extend lifespan of landfill. (Decision-Maker).

CONCLUSION

- Recycling and Scavenging are a source of surviving strategy for poor communities during the current political and economic situation imposed on the Gaza Strip for 11 years now.
- Scavengers prefer to sell their recycled products to middlemen not to worry about market, save time and effort and build sustainable business relationship.
- Scavengers prefer to search and recycle in landfills assuming that, much valuable items could be found there, practice scavenging activities within scavenging community away from the public.
- High willingness of public to use recycled products however, Public health was the main concern of respondents followed by religious (najas) and cultural aspects. While the danger of improper management is the second concern.
- Scavenging proved to be an efficient source of income to most of poor families during the current siege. However, scavenging occurs in an unhealthy hygienic environment. Scavenging is an illegal practices according to the Palestinian Authority regulations. Scavengers work with no identities and randomly and no official institution support their rights.
- Respondents were fairly responded to start source separation. However, awareness programs on source separation and incentives from municipalities to encourage the public to start separation are not available. Also infrastructure like regular collection and transportation and transfer stations to encourage source separation are not available.

Scavenging represents an important survival strategy for poor people in the Gaza Strip, in which individuals recover materials from waste to satisfy their needs. Despite the fact that scavenging occurs in quite different environments throughout the Gaza Strip, it shows distinct patterns. They respond to market demand and not to environmental considerations. Middlemen often take a large percentage of the profit from the sale of materials, which helps explain scavengers' low incomes. Scavenging takes place in a wide variety of settings, from municipal landfills to open dumps and waste containers. In addition, to chronic poverty, scarcity brought about by the current siege imposed on the Gaza Strip associated with severe economic crises also encourage people to resort to scavenging in order to satisfy their needs.

Authorities in the Gaza Strip do not fully realize the social, economic and environmental benefits of the recycling activities carried out by scavengers.

Recycling of MSW seems to be the most efficient and sustainable SWM due to the following benefits: Reduction in raw materials, saving in energy, reduction in pollution and employment creation. Recycling and scavenging as an environmentally sound disposal strategy parallel to landfilling is highlighted by local authorities and environmental NGOs. It's a good example of waste element where it is necessary to work on all aspects if the initiative is to succeed. It has a social aspect (low or no-income people, minority groups, gender), an institutional/organizational aspect (urban space for workshops, storage and transfer, links between formal/informal collection system), a political aspect (recognition and inclusion in waste strategy), a technical aspect (low-cost technology, labour intensive, working conditions), though the latter aspect may get ignored and last but not least an economic aspect (marketing of the collected –waste-materials).

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