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Private partnership of solid waste management in the Palestinian municipalities

Abstract

This study presents the issue of solid waste collection and dumping management, in the Palestinian local governments represented by municipalities. This issue was examined through measuring the feasibility of the existing status in the Palestinian municipalities and analyzing cost-revenues aspects of such services in selected Palestinian municipalities. In addition, the opinion of the Palestinian citizens as well as the perceptions of selected stakeholders towards major aspects of managing and collecting Palestinian municipal solid waste, were collected, including the concept of private participation. Other concepts and alternatives were explored regarding the best ways and means of implementing this complicated activity and making it less expensive as well as more efficient. The participated stakeholders include the municipal management staff from selected Palestinian municipalities as well as Palestinian municipal residents.

Based on the findings of this study, it may be reported that the function of solid waste is still completely run by Palestinian municipalities, in spite of the fact that there is a private sector participating in offering some municipal services. The solid waste activity costs the Palestinian municipalities from 3% to 32% of the total budget. The majority of the municipal officials believe that the responsibility of covering-dumping the solid waste should be transferred to joint specialized councils which may be established among different municipalities. In addition, the issue of dumping the garbage after being gathered, and the small amount of garbage fees and the low collection efficiency are the major problems facing the solid waste activity faced by Palestinian municipalities. The Palestinian residences still prefer that municipal activities be supplied by municipalities and not by the private sector.

Finally, it may be concluded that in spite of the fact that the solid waste collection function in the Palestinian municipalities is the function the loses the most within the functions operated by local governments, in which the collected fees are much lower than the allocated and actual expenditure to run such a function, and such a function's costs totals up to one third of the total annual operation budgets in some municipalities, but residents still hesitated to accept the concept that this function should be transferred partially or totally to the private sector. Accordingly, this study recommends increasing the fees of gathering industrial institutions garbage and to establish joint councils for dumping processes of municipal solid waste. The concept of privatization of this municipal function or calling private sectors to participate in one of the processes may need national awareness campaigns and assurance that qualified private sector firms are available, in moderate cost with high efficiency.

Keywords: private participation; Palestinian municipalities, management of municipal activities.

JEL Classification: M1, H7, M4, M40.

Introduction

The local governments are getting more attention due to the recent efforts of implementing decentralization, improving performance and efficiency, applying democracy concepts, enhancing the contribution of community and residents in strategic decisions of local governments as well as increasing the participation of the private sector. For example, the World Bank report which was just released (World Bank, 2009, May) indicated that cities now host half of the world's population and provide 70 percent of its gross domestic product, making them engines of growth, thus, there is a need to focus on three dimensions of municipal planning, finance, and service provision.

On the other side, the local government in Palestine has evolved during the Ottomans era, thereafter developed during the British, the Jordanians, and the Palestinian Authority eras. Today, the Palestinian local government sector, including municipality councils and village councils, offer

services to local residents. Such services include creation and maintenance of roads, water and electricity supplies, controlling of buildings, building permits, infrastructure and building projects, and providing health and environment services as solid waste collection operations. The last function became more and more costly and hard to manage due to various reasons. The major Palestinian municipalities are facing significant losses regarding this task as recently reported. For example, Nablus, Jericho, Bethlehem and Ramallah faced annual losses ranging between one million to three million dollars annually, in which the collected fees is less than the allocated expenditures according to their annual budgets (PNA, Municipalities budgets, 2006-2008).

Accordingly, there is a need to consider alternatives to cope with such an issue, in order to reduce the cost and increase the efficiency of such operation. Participation of private sector is one of the alternatives which are now considered in many developed and developing local governments. The concept of private participation known as Private Public Participation (PPP) came recently to re-

place the dramatic privatization procedures of public projects including the municipal services. Thus, the private-public partnership may be a good alternative to be examined regarding municipal specific services such as solid waste collection and management.

1. Purposes of the study

This study aims to explore the issue of solid waste collection and management, through examining the feasibility of the existing status and to analyze the cost-revenues aspects of such service in selected seven major Palestinian municipalities. In addition, to perceive the opinion of the Palestinian citizens as well as the major perception of selected stakeholders towards major aspects of private participation in managing and collecting Palestinian municipal solid waste. In more details, this paper is aiming to accomplish the following purposes:

1. To explore to what extent the private sector is participating in the municipal activity of solid waste management.
2. To examine the profitability of the existing municipal services regarding the solid waste collection and management.
3. To point out the financial burden of this service on the Palestinian municipal budget.
4. To analyze the cost items of the existing municipal service regarding the solid waste collection and management.
5. To indicate the perceptions of municipal *residents* regarding major issues of municipal solid waste management including the concept of privatization or private share with municipalities known as PPP.
6. To indicate the perceptions of municipal *managers* regarding major issues of municipal solid waste management including the concept of privatization or private share with municipalities known as PPP.
7. To recommend relevant policies in regard to management of municipal solid waste based on the participated stakeholders.

2. Review of the related literature

2.1. Literature related to Palestinian local governments. Various researches have been conducted to examine, in general aspects of managing Palestinian local governments. In order to examine and to improve the efficiency of municipal offered services to residents including creation and maintenance of roads, supplying and distribute of water and electricity to residents, planning and controlling of buildings, infrastructure, general markets, health and environment services and solid waste collection. For example, the action plan study (UNDP,

2005) recommended strengthening community participation and enhancing transparency and improving efficiency of the Palestinian local government units. The PRDP plan 2008-2010 (PNA, PRDP, 2008) committed to local government reform in order to bring governments closer to the people, in order to build accountable local government institutions. Sabri and Jaber (2007 and 2010) reported that the efficiency of local governments is still limited in the Palestinian municipalities. Sabri (2010) found that both mayors and municipal councils' members accept indirect community communication and participation but they don't encourage the adaptation of face-to-face practices and direct community participation. The action plan study (UNDP, 2005) identified various issues to be addressed to include, improving the level of decentralization system, strengthening fiscal, organizational and management capacity and enhancing transparency of the Palestinian local government units. The PRDP plan (PNA, PRDP, 2008) considered the strengthening of the Palestinian local government as one of the intermediate objectives, in order to improve its governance.

However, for investigating the issue of the solid waste management as one of the major municipal services by the Palestinian municipalities, some reports were conducted mainly in the Palestinian local municipalities in the Gaza strip in the last decade. They were mainly intended to report the various experiences conducted by international NGOs, such as to introduce solid waste management councils in some parts of the Gaza Strip (Dilewski, et al., 2004, and Safi, 2004) to assess the recycling sector of solid waste in Gaza Strip (Safi, 2009), while other technical reports about Cost reduction through waste minimization (Vest, 2003) were related to Awareness (Zonneveld and Zakout, 1999) and others related to Tariff Study of solid waste collection (Disselkoen, 2000) and there technical are reports.

2.2. International experience. A number of studies discussed the concept of public-private participation in supplying services by local governments in general and in solid waste management in particular. For example, Bognetti and Lobtti (2007), Levin and Tadelis (2007), Torres and Pina, (2001), Nallathiga (2007), Chong et al. (2006), Bing et al. (2005) discussed the general concept of using Public/private partnerships (PPP)/PFI in offering municipal public services.

For municipal solid management various studies discussed the various aspects in both developed and emerging economies. For example, Bel and Costas (2004) discussed this issue in Spanish municipalities

and reported no significant effects of the mode of production (public/private) on costs borne by municipalities. Abd Manaf et al. (2007) reported that benefit-to-cost ratios showed that composting, recycling, a combination of recycling and composting of solid waste management, and a combination of composting and incineration could be the most appropriate alternatives for handling the solid waste management in Malaysia. Sumalde (2004) discussed financing of solid waste management in the Philippines. It found that there is a gap between the amount of money needed for waste management and the amount of revenue obtained by LGUs from providing waste management services and recommended a number of possible strategies to improve that by looking into recycling as a revenue-generating activity.

Halstead and Park (1996) reported that economic concepts and principles may be used to reach sound decision making in solid waste management such as opportunity cost, and marginal analysis of costs and benefits. Bartone, Bernstein and Wright (1990) presented the findings of the World Bank experience in municipal solid waste management and recommended various approaches to improving future Bank performance in this subsector, and reported the new efforts to be directed at establishing appropriate solid waste-related laws and procedures at the national, state, and local levels. Ndeto (2009) discussed this issue in cities of Ethiopia, taking the municipality of Arba Minch as a case study and found inadequate financial capacity and inability of institutions to finance, administer and monitor disposal of SWM services. Ye, Chunhui and Ping Qin (2008) evaluate the impacts of different factors on service provision at the village level in rural China for solid waste disposal and found that living density, village per capita income, the ratio of irrigated land, and the per capita profit submitted by village enterprises to the Villagers' Committee have positive impacts on service provision.

Khalil and Khan (2009) assessed the current practices and state of solid waste management systems in one medium-sized Indian town, and found that the waste management situation in Aligarh is still not adequate. Shylajan and Souvik (2007) found the Municipal Corporation in India, which is responsible for waste management spends a substantial amount of their annual budget on waste collection and transportation and the method of waste disposal is unsafe, which therefore causes a range of social costs including human health hazards. Zia and Devadas (2007) found that the existing solid waste management system in the Kanpur city appears to be highly inefficient and recommended the need to

establish a detailed database regarding the quantity and quality of the solid waste. Dijkgraaf and Gradus (2004) found that pricing has no effect on the waste management in surrounding municipalities and that unit-based pricing may lead to illegal dumping.

3. Methodology

The following research instruments were used to accomplish the stated purposes of the study:

First, financial analysis of the municipal solid waste management in order to examine the cost-revenues of solid waste management in seven major Palestinian municipalities for the last three years. In addition, the cost items analysis will be conducted for one municipality as a case study to identify the most expensive element in managing the municipal solid waste, which may help in finding a reduction in cost instruments. The data was collected directly from the respective municipalities as well as from the Palestinian local government database as in 2008.

Second, a special questionnaire was articulated and included the majority of the related technical and economical issues, as well as suggested policies and procedures of the municipal waste collection and management activities. This instrument was directed to 30 major municipalities by emails using the APLA Palestinian municipal manual (APLA, 2006). The sample included large cities which were classified as "A" municipalities, and small municipalities which were classified as "B" or "C" municipalities. The total local government units are 121 municipalities, and 355 village councils and project committees, there are 575 mayors and 4,214 council members, of which 3,651 were males and 563 females (PCBS, 2008). A sample of 100 citizens from the selected municipalities participated in the study regarding the second questionnaire which aimed to get the perceptions of citizens regarding the concept of privatization of municipal solid waste collection activity.

4. Findings of the study

This study aims to discuss the issue of managing solid waste as a major activity of the Palestinian municipalities, through considering the participation of the private sector. Therefore, the findings of this study will present, first, the feasibility of the activity as existed in the Palestinian municipalities, and then, the concept of private sector participation in this activity, that will be presented based on the perceptions of the major stakeholders including the municipal management staff and residents.

4.1. Private sector participating in the municipal activity of solid waste management. To explore

to what extent the private sector is participating in the municipal activity of solid waste management, the study checked about ten Palestinian municipalities regarding the private participation in the municipal service activities and found that none of the municipalities utilized the private sector to participate in this job as shown in Table 1.

Table 1. Private participation in municipal activities as existed in the Palestinian municipalities

Municipalities	Solid waste management	Examples of private participation in municipal activities
Nablus	No	Commercial buildings, vegetable market, halls
Jericho	No	Electricity, commercial buildings
Bethlehem	No	Electricity, commercial buildings
Ramallah	No	Electricity, commercial buildings, slighter houses
Bet-Omer	No	Commercial buildings, vegetable market
Qalqilia	No	Commercial buildings, halls
Tulkarem	No	Commercial buildings, vegetable market
El- Ram	No	Commercial buildings, vegetable market
Hebron	No	Commercial buildings, vegetable market, parking
Al-Birah	No	Electricity, commercial buildings, halls, gardens

It shows that in spite of the fact that there are some forms of private participation in municipal service offerings, such as in commercial buildings, running vegetable markets, halls, supplying of electricity, running of gardens, the function of solid waste, but is still completely under the management and operation of municipalities. However, some municipalities conducted various studies in both the West Bank and Gaza Strip about the possibility of transferring some processes of solid management, such as collecting, dumping, and or processing functions, but none of these municipalities transferred such functions to private sector up to now partially or totally.

4.2. Profitability of the existing municipal services regarding the solid waste collection and management. In order to examine the profitability of the existing municipal services regarding the solid waste collection and management, eight major Palestinian municipalities were selected to analyze both, the revenues of the collected fees from municipal citizens, as well as the direct expenditure of the municipal functions of collecting and dumping the solid wastes, in the last three fiscal years, between 2006 and 2008. As shown in the table all selected municipalities were facing losses from this activity, the losses ranged from three NIS quarter million as a minimum to about NIS 20 million as a maximum in case of Nablus municipality. In addition, most of the large municipalities were facing losses that ranged from NIS 7 to 10 million such as in the case of Bethlehem, Ramallah, and Al-Birah as presented in Table 2.

Table 2. Financial analysis of solid waste collection function operated by selected Palestinian municipalities in million NIS and ratios (2006-2008)

Municipalities	Years (period)	Expenditures	Revenues	Profit (Loss)
Nablus	2007-2008	23.989	4.091	(19.890)
Jericho	2006-2008	5.207	1.624	(3.583)
Bethlehem	2007-2008	8.859	1.449	(7.397)
Ramallah	2007-2008	12.730	4.144	(8.586)
Bet-Omer		0.775	0.060	(0.715)
Qalqilia	2008	2.690	1.541	(1.150)
Birzeit	2007-2008	1.610	0.424	(1.186)
Al-Birah	2006-2008	12.7	2.500	(10.20)

Sources: Compiled by authors based on collected data and municipalities' budgets. PNA (2006-2008). The budget statements of local governments database, Ministry of Local Governments, Al-Birah.

Such losses are covered annually from other profitable activities such as water and electricity projects as well as from other collected fees, specially building fees, which presents the major revenue items in most of the large Palestinian municipalities. These annual losses of municipal solid management create a critical burden to the municipal budget in the majority of the Palestinian municipalities as shown in Table 3.

Table 3. Financial analysis of solid waste collection function operated by selected Palestinian municipalities in million NIS and ratios (2006-2008)

Municipalities	Period	% of budget
Nablus	2007-2008	(4%)
Jericho	2006-2008	(6%)
Bethlehem	2007-2008	(32%)
Ramallah	2007-2008	(13%)
Bet-Omer	2007-2008	(3%)
Qalqilia	2008	(3.4%)
Birzeit	2007-2008	(12.8%)
Al-Birah	2006-2008	(13%)

Sources: Compiled by authors based on collected data and municipalities' budgets. PNA (2006-2008). The budget statements of local governments database, Ministry of Local Governments, Al-Birah.

The losses produced of running the basic activity of solid waste collection and dumping ranged from 3% of the total operation annual municipal budget in Bet-Omer, to 4% as in the Nablus municipality, to 13% in Al-Birah and Birzeit municipalities, to 32% as in Bethlehem municipality. However, it should be noted that that the ratio of losses to total operation annual budget is higher in municipalities which have no utility projects compared to municipalities that own and run utility projects such as electricity and water projects.

Finally, to analyze the cost and expenditure items of municipal solid waste management in the Palestinian municipalities, we considered one municipality as a case study which is Qalqilia municipality, and found that the labor cost was about half the total cost, fol-

lowed by Solar cost to operate the garbage cars which formed about 19% of the total cost shown in Table 4.

Table 4. Analyzing the cost expenditure items and revenues of municipal solid waste management as existed in Qalqilia municipality in 2008

	Cost analysis
Solar	19%
Depreciation	12%
Administration expenses	13%
Labor cost	44%
Maintenance part	04%
Maintenance labor	8%
	Revenue analysis
Total expenditures	100%
Homes fees	64%
Business fees	36%

Source: Qalqilia municipality database, financial department, 2009.

On the other hand, the houses' fees formed two thirds of the total garbage fees, while the fees collected from business firms formed only one third of the total revenues.

4.3. The perception of municipal residents' towards privatization of solid waste collection function. The Palestinian residents still prefer that municipal activities be supplied by municipalities and not by a private sector as presented in Table 5.

Table 5. Perceptions of municipal citizens towards private participation in solid waste management

	Mean
I prefer that the municipalities own and operate the activities and projects	3.74
I prefer privatizing the solid waste collection even if this will increase the fees on citizens	2.64

They don't accept the suggestion to transfer the solid waste collection function to a private sector. The majority of the residents in about ten Palestinian municipalities gave a weight of 2.65 out of 5 points as presented in Table 5, which is closer to the disagree opinion. It seems that the residents are worried that such an action may lead to an increase in the fees of collecting their garbage, once this function is transferred to a private sector partially or completely.

4.4. The perception of municipal management staff concerning the concept of private participation in managing the solid waste function and other suggested ways and means of managing the solid waste function. The municipal management staffs of selected Palestinian municipalities were asked to express their opinions regarding various aspects of managing the solid waste function by indicating the extend to which they agree on suggested listed ten policies and procedures. The majority of the study participants from municipal officials accepted that the fees of gathering garbage from business institutions including commercial and industrial firms should be increased,

and they believed that the responsibility of covering-dumping the solid waste should be transferred to joint specialized councils which may be established among different municipalities. The previous three topics or statements received the highest approval from municipal officials, which got about 4 points and above in a Likert scale of five points as presented in Table 6, which presents the perceptions of municipal management staff towards suggested policies and procedures of managing of solid waste management.

Table 6. The perceptions of municipal management staff towards suggested policies and procedures of solid waste management

Issues, policies and procedures	Mean
1. Yes, there is a critical problem related to the services of gathering solid waste in the city	3.76
2. Yes, there is a critical problem related to covering solid waste	3.75
3. The fees of gathering household garbage should be increased	3.82
4. The fees of gathering commercial institutions garbage should be increased	4.49
5. The fees of gathering industrial institutions garbage should be increased	4.88
6. The responsibility of solid waste collection should be transferred to the private sector	2.65
7. The responsibility of covering solid waste should be transferred to the private sector	2.75
8. The responsibility of covering solid waste should be transferred to a joint council among different municipalities	4.16
9. Civil local communities should be established to solve the problem of gathering waste	3.98
10. The fees of collecting garbage should be correlated with the household area and the number of family members	3.70

On the other side the concept of privatization of solid waste management in the Palestinian municipalities got the least agreement from the participants of the study. In which both statements, the responsibility of solid waste collection should be transferred to the private sector, and the responsibility of covering solid waste should be transferred to the private sector, were ranked as lower than point three of Liker scale (average of 2.65 and 2.75, respectively). However, other price and management policies received moderate acceptance such as; to establish civil local communities to solve the problem of gathering waste, the fee of collecting garbage should be correlated with the household area and the number of family members, which received acceptance from three to four points out of five of the Likert scale.

Finally, in order to identify if there is a difference between the perceptions of large and small municipalities towards listed policies and procedures of solid waste management, a "t-test" was conducted for each of the listed issues, policies and procedures. However, in spite of the fact that there are some differences in the average means of the opinions of the management staff in small and large cities, there were no significant differences between both groups as presented in Table 7.

Table 7. Differences between the perceptions of large and small municipalities towards listed policies and procedures of solid waste management

Issues, policies and procedures	Mean big cities	Mean small cities	t-test value	Significant (2-tailed)
1. Yes, there is a critical problem related to the services of gathering solid waste in the city	3.82	3.69	.227	.823
2. Yes, there is a critical problem related to covering solid waste	3.55	3.92	.602	.554
3. The fees of gathering household garbage should be increased	3.64	4.00	-.877	.390
4. The fees of gathering commercial institutions garbage should be increased	4.36	4.62	1.216	.237
5. The fees of gathering industrial institutions garbage should be increased	4.55	4.77	1.142	.266
6. The responsibility of solid waste collection should be transferred to the private sector	2.73	2.46	.604	.552
7. The responsibility of covering solid waste should be transferred to the private sector	2.64	2.85	.534	.599
8. The responsibility of covering solid waste should be transferred to a joint council among different municipalities	4.18	4.15	.087	.932
9. Civil local communities should be established to solve the problem of gathering waste	3.82	4.15	.914	.379
10. The fees of collecting garbage should be correlated with the household area and the number of family members	3.64	3.69	.154	.879

However, from the small differences of opinions about management between the small and large cities, we may note that transferring the responsibility of covering solid waste to the private sector is more acceptable in large cities compared to small cities, this is also applied to the policy of increasing the fees of gathering industrial institutions garbage.

4.5. The most critical problems the Palestinian municipalities facing in conducting the activity of collecting and dumping the solid waste. This question was answered by the municipal managers. As presented in Table 8 it is obvious that the most *critical problem* is the cost of dumping the garbage after being gathered, which is a most important problem by the majority of participated municipalities including small and large municipalities. The shortage of garbage fees is the second major problem facing the solid waste activity faced by Palestinian municipalities, in addition, the collection ratio of the due garbage fees is low, which means a substantial part of municipal residents don't pay their debts; in this regard this matter was ranked problem number three by municipalities management staff as presented in Table 8.

Table 8. Identify problems the Palestinian municipalities facing in conducting the activity of collecting and dumping the solid waste

	The whole sample	The big cities	The small cities
The cost of dumping the garbage after being gathered	1	1	1
Lack of land and facilities to cover garbage after being gathered	4	5	3
The shortage of garbage fees	2	4	2
A low collection ratio of the due garbage fees on residents	3	2	4
The collecting of industries and workshops garbage	6	6	6
Lack of cooperation among the inhabitants of the city in gathering their garbage	5	3	5

However, the cooperation among the inhabitants of the city in gathering their garbage, and collecting industries and workshops garbage were the easiest problem the Palestinian municipalities facing in conducting the solid waste management.

However, if we look at the differences that exist between the official opinions of small and large cities in identifying their major problems regarding the management of municipal solid waste, we found some agreements regarding the issues of the cost of dumping the garbage after being gathered and collecting industries and workshops garbage. While on the other hand, there were some differences regarding the issues of the lack of lands and facilities to cover garbage after being gathered, the collected ratio of the due garbage fees on residents, and the degree of cooperation among the inhabitants of the cities in gathering their garbage.

Summary and conclusion

This study explores the issue of solid waste collection and dumping management, through examining the feasibility of the existing status in the Palestinian municipalities and to analyze the cost-revenue aspects of such services in selected major Palestinian municipalities. In addition, the study aims to perceive the opinion of the Palestinian citizens as well as the perception of selected stakeholders towards major aspects of private participation in managing and collecting Palestinian municipal solid waste, including the municipal management staff as well as Palestinian municipal residents. Other concepts and alternatives were explored regarding the best ways and means of implementing this complicated activity and making it less expensive as well as more efficient.

Based on the above presented findings, the following conclusions may be articulated as the output of this study:

- ◆ The function of solid waste is still completely under, the management and operation of the Palestinian municipalities, in spite of the fact that there

is a private sector participating in offering some municipal services such as running vegetable markets, supplying electricity, and running gardens.

- ◆ The losses produced to run the basic activity of solid waste collection and dumping ranged from 3% to 32% of the total operation municipal budget.
- ◆ The majority of the municipal officials believe that the responsibility of covering-dumping the solid waste should be transferred to joint specialized councils which may be established among different municipalities.
- ◆ However, some suggested, price and management policies, received moderate acceptance by the municipal officials, including establishing civil local communities and to state fees based on household area and the family members.
- ◆ The issue of dumping the garbage after being gathered, the shortage of garbage fees, and the low collection efficiency are the major problems facing the solid waste activity faced by Palestinian municipalities.
- ◆ The Palestinian residents still prefer that municipal activities be supplied by municipalities and not by private sector.
- ◆ The majority of participants disagree about the suggestion that solid waste management should be transferred to the private sector.

Finally, it may be concluded that residents still hesitated to accept the concept that this function should be transferred partially or totally to private sector, in spite of the fact that the solid waste collection function in the Palestinian municipalities suffers great losses, in which the collected fees are much lower than the allocated and actual expenditure to run such a function, and such a function costs the municipal annual operation budget up to one third of the total budgets in some municipalities. However, it should be noted that in another study (Sabri, Jaber and Hanya, 2010) reported that when the participants of municipal stakeholders were asked to select one activity from various listed municipal activities to call a private sector participation in, the majority select solid waste management activity compared to other activities such as water project for example.

Accordingly, this study recommends to increase the fees of gathering industrial institutions' garbage and to establish joint councils for dumping processes of municipal solid waste. The concept of privatization of this municipal function or the call of private sector participation of one of the processes may need national awareness campaigns and assurance that qualified private sector firms are available in moderate cost with high efficiency.

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