

A CASE STUDY OF INNOVATIVE BUSINESSES INVOLVED WITH EFFICIENT MUNICIPAL SOLID WASTE MANAGEMENT IN ISLAMABAD, PAKISTAN

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ABSTRACT

This paper deliberates on an innovation in the field of municipal solid waste management being practiced in a housing scheme developed and maintained by private sector in the capital city of Islamabad, Pakistan. The purpose of this case study is to know about the initiation of the unusual social business in the area of municipal solid waste management, challenges faced in establishing the business, and how it emerged as a successful model. This study also assesses the efficiency and effectiveness of this model of municipal waste management. A household survey has been conducted in the project area to know about the satisfaction of the users and their views about the location of waste compost facility established in the area. Moreover, in-depth interviews have been conducted with the management society of the area working under the private sector that developed the housing scheme, to ascertain the effectiveness and efficiency of the current solid waste management system. The innovative social enterprise has been found successful. A proactive role of local as well as of international NGOs is highly appreciable in providing seed funding and extending technical assistance in making the initiative a success story. The social enterprise has brought about improvement in waste collection, transportation, and recovery of recyclables and waste reduction measures through waste composting. The success story of the unusual social enterprise has convinced the regulatory authorities of capital city to replicate the same model in other residential and commercial areas of the city.

Keywords: business unusual, efficient municipal waste management, social enterprise, waste recycling, NGOs, waste reduction strategy, integrated resource recovery centre (IRRC), zone 2, Islamabad.

1 INTRODUCTION

The world has experienced unprecedented urban growth in recent decades. It is estimated that 60 percent of the world population will be urban by 2025 according to a report by BBC World [1], with most of the urban growth occurring in less developed countries. As cited in the Planning Commission of Pakistan [2], by the year 2030, the urban population of Pakistan would be about 50% with 17 cities having urban population exceeding one million. This critical condition engenders various challenges for availability of public amenities as fast increasing urban population component seriously impacts availability of infrastructure, housing, urban services such as solid waste management closely associated with daily life and having direct impacts on environment as well as economy of the cities (Haider and Badami [3]). According to Agenda 21 [4], by the end of this century, 2 billion people will be without an access to basic sanitation and half of the estimated population will be without access to the solid waste management services. Presence of solid wastes in the communities is the root cause of 40 human diseases. Inappropriate and conventional management of ever increasing municipal waste quantities especially in developing countries has become an uncontrolled and overburdened issue for the concerned departments, Annual Report AHKMT [5]. Annual population growth rate in Islamabad is 5.2%, which is higher than rest of the country, Population census [6]. Responsibility of services delivery such as water supply, sewerage, drainage and management of municipal solid waste in municipal area remained



with Capital Development Authority (CDA), while in rest of the Islamabad, this responsibility rested with Local Government of Islamabad Capital Territory Administration (ICT) until recently, the function of services delivery, stands transferred to Metropolitan Corporation Islamabad (MCI) in the whole of Islamabad.

2 MUNICIPAL SOLID WASTE MANAGEMENT IN ISLAMABAD

Master plan of Islamabad [7], the capital of Pakistan, was prepared in 1960, which divides the capital city into five zones. Zones 1, 2, and 5 are meant for housing, zone 3 comprises of old villages, Margalla hills and Margalla National Park Area, whereas zone 4 usually known as Islamabad National Park, provides for housing, farm housing and large institutions. Concentration of population in Islamabad is mainly in zone 1, 2, 4 and 5, attributed to CDA developed sectors in zone 1, housing developments in private sector in zone 2 and informal settlements in zone 4 and 5 (ICT Zoning Regulation [8]).

As a matter of fact, management of municipal solid waste is undertaken by CDA only in zone 1, whereas services provision in residential developments in zone 2, 4 and 5 is the responsibility of respective developers and builders, as in [8]. Other than that, residential developments were carried out in private sector in zones 2, 4 and 5, however, there is no formal arrangement of municipal waste collection, transportation and disposal, but dumped on open areas along major roads, hidden open spaces and banks of water streams, Director General Civic Management, CDA [9]. Alike other developing countries, selection and development of waste disposal site based on sound planning, engineering and environmental safety principles in terms of availability of land and other expenses, is yet an outstanding issue, as in [5].

Segregation of recyclables is all in informal arrangement at various stages, ranging from source segregation by housemaids, scavenging at communal collection points and waste

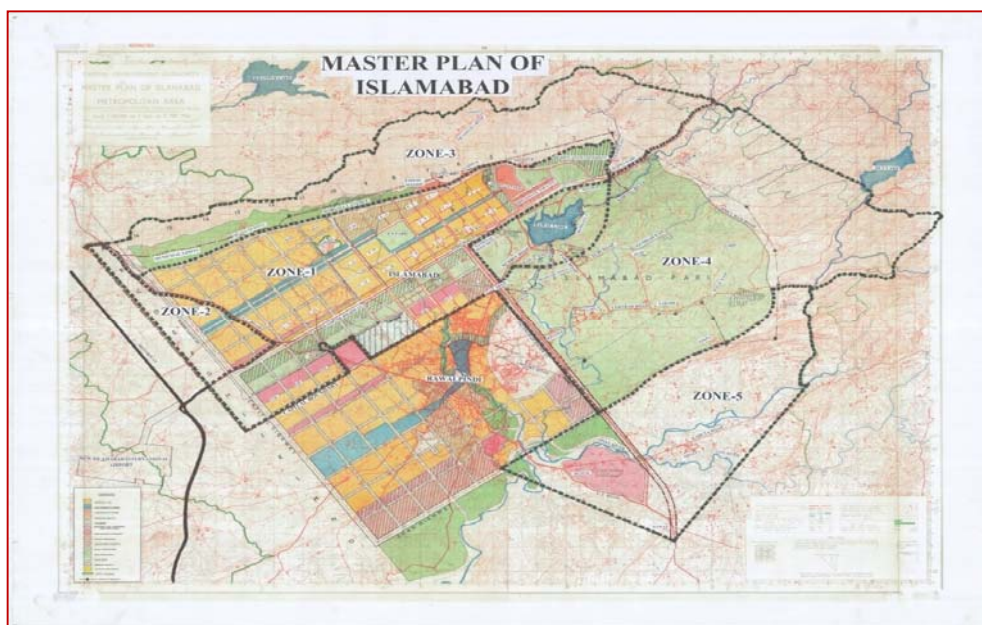


Figure 1: Master plan of Islamabad. (Source: Capital Development Authority, Islamabad.)

disposal site, Chief Sanitary Superintendent, CDA [10]. Moreover, there is no formal institutional arrangement for segregation of recyclables, recoverable, reusable and waste treatment. As reported by 10 interviewees of CDA Area Sanitary Inspectors [11], usually the role of NGOs, CBOs and other stakeholders is restricted to the extent of occasional awareness campaigns supported by donors.

In localities outside the municipal area, the responsibility of infrastructure provision in the residential and commercial developments in zones 2 and 5 lies with the respective developers [8]. However, the provision of municipal services including management of municipal solid waste is hardly found adequate or appropriate, as in [5]. The identified gap provided a space for intervention by a third sector for provision of effective solid waste management services. This study attempts to explore and highlight the case of intervention by a third sector in the form of an integrated resource recovery centre (IRRC).

3 RESEARCH OBJECTIVES

The key objective of the study is to explore the ins and outs of the unusual business in the area of municipal solid waste management. The specific objectives of the study include:

1. To find out the motives behind the conception of the initiative.
2. To investigate the barriers in launching of unusual business and the factors responsible for the promotion and success of the initiative.
3. To highlight the steps taken by the service provider to ensure provision of adequate and appropriate municipal waste management service.
4. To look into the social, economic and environmental benefits of the initiative.
5. To identify the steps taken to ensure sustainability of the system.
6. To ascertain the efficacy of the IRRC unusual business initiative for its replication in other residential/commercial sectors developed by the private sector.

4 RESEARCH METHODOLOGY

The research methodology employed for the case study comprises ocular observation, in-depth interviews, and a questionnaire survey. Interviews were conducted with the Program officer of AHKMT, the service provider along with other employees engaged in door-to-door waste collection, segregation of recyclable materials and operation of Integrated Resource Recovery Centre (IRRC) to have in-depth information about the initiation of the project, factors for success of the model, response of the residents and the society management towards the execution of the system, weaknesses to be rectified and suggestions for improvements to warrant its sustainability and its potential for replication.

Interviews were also conducted with the society management in order to ascertain their satisfaction with the solid waste management services provided by the third sector. Moreover, questionnaire survey was conducted with the residents of the community to know about their satisfaction with the service provider.

5 THEORETICAL BACKGROUND

The concept of social enterprise can be traced in a number of countries around the globe. For example, in Italy, it can be traced since 1980s, where a new journal named “Impresa Sociali-Social enterprise” was launched concerned with social cooperatives working mainly for welfare services (Defourny and Nyssens [12]). The concept of social enterprises has deep roots in Finland and Sweden, where a large number of labour cooperatives have been established to assist the unemployed and nursery cooperatives for childcare respectively, as in [12]. Development of new social enterprise and reshaping the



established third sector organizations in changed context and market dynamics in public services provision are the major dimensions and the themes underlying the new social enterprises, as in [12]. The role of third sector or social enterprise is being recognized globally for cost effectiveness and for sustainable provision of municipal services in various cities, as in [12].

European Commission [13], defines social enterprise as “an organization that combines a social purpose with entrepreneurial activity”. Similarly, Social Enterprise UK [14], defines it as “A business driven by social and/or environmental purpose. Their assets are often looked for community purposes”, while according to Social Enterprise Alliance [15], “Social enterprises are businesses where the power of marketplace is used to progress the social, environmental and human justice agenda”.

A comprehensive definition has been given by the British Council [16], which is quoted below:

Social enterprises are businesses, which trade in order to address social and environmental problems. They generate income like other businesses, but reinvest all or most of their profits into their social mission. They create jobs, reduce inequalities and are accountable for their actions, bringing together the entrepreneurial skills of the private sector and the values of public service.

The potential of social enterprise can be harnessed once it is acknowledged that social and economic outcomes are to be achieved by the governments, with the help of third sector and the government would be supportive for larger role of social enterprise in service delivery, Defourny and Nyssens [17]. There can be found strong legislation regarding social enterprise in developed countries such as UK, Italy, Spain, Finland, Greece, France etc. since 1991, as in [17], which is summarized in Table 1.

Similarly, existence of social enterprise is traced in Japan, South America and South Korea after legislation in 2007, as in [17].

In Pakistan, Social entrepreneurship is comparatively a new approach, however, given the burgeoning social, economic and environmental problems, it has great potential to overcome the problems, Khan [18].

Table 1: Legislation for social enterprise.

Country	Type of Structure	Date formed	Number
Italy	Social co-operative	1991	7,000+
Portugal	Social solidarity co-operative	1996/98	500+
Spain	Social initiative co-operative	1999	
Spain	Work integration enterprise	2007	
Greece	Limited liability social co-operative	1999	
France	Collective interest co-operative society	2000	94
Latvia	Social enterprises law	2004	
Lithuania	Social enterprise	2004	
Poland	Social co-operative	2006	
Belgium	Social finality enterprise	1996	400
Finland	Social enterprise	2004	69
UK	Community interest company	2005	2,000+
Italy	Social enterprise	2005/06	

Source: Defourny, J & Nyssens, 2008.



On the issues of municipal waste management in Islamabad, program officer of an NGO titled Akhtar Hameed Khan Memorial Trust (AHKMT), informed in a meeting of community based resource recovery municipal waste management initiative, in a residential settlement developed in private sector, where there is no formal municipal waste management service. This aroused interest of the authors to explore the initiative in detail.

6 DESCRIPTION OF CASE STUDY AREA

The project area is located in zone 2 of Islamabad, where housing schemes are to be planned and managed in a private setup. The project area is known as Khayaban-e-Kashmir, sector G-15, developed by Jammu and Kashmir cooperative society. In this settlement, there are 4500 residential planned plots in addition to commercial plots and community facilities. Provision of municipal services like municipal waste management and other infrastructure is the responsibility of the respective cooperative society, as in [8].

Presently, 2000 houses are constructed out of planned 4500 residential units and there is an increase of approximately 300 units annually as the settlement is in the phase of development, Program manager AKHMT [19].

6.1 Municipal solid waste management in case study area

An interview with the society management revealed that initially, there was no formal arrangement for collection and disposal of garbage other than 2/3 sweepers for occasional sweeping Chairman Jammu and Kashmir Cooperative Housing Society [20]. The increased built housing units in due course of time, necessitated the provision of adequate municipal services and as a consequence of public pressure, the society management arranged garbage collection at the expenses of the households.

This service was limited to irregular door-to-door waste collection, with no arrangement for regular cleaning of common areas and haphazard open-air waste disposal in the nearby open spaces, as in [20]. This poor state of affairs of inadequate and inappropriate mandatory service created awareness in residents to pay appropriately for appropriate service and the society management for making necessary arrangement, which led to the engagement of a

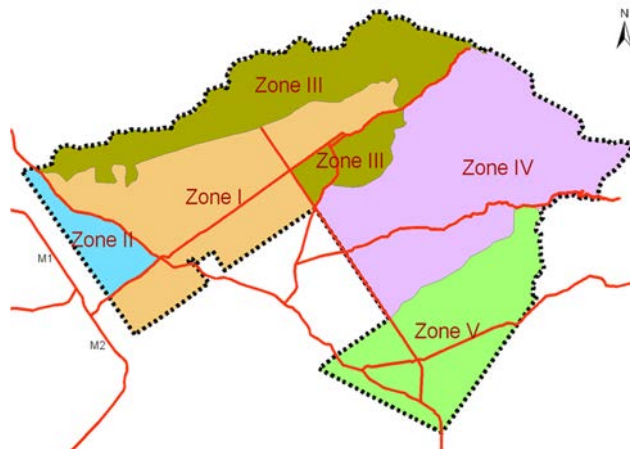


Figure 2: Zones of Islamabad. (Source: ICT Zoning Regulation, 2010 for Zone 4, Islamabad.)

service provider. In order to fill this gap, the society management approached the Akhtar Hameed Khan Memorial Trust (AHKMT), an NGO working with communities in various fields including municipal waste management. The society management signed an agreement with the NGO for door-to-door waste collection, safe transportation and disposal of the garbage at an affordable price in the year 2012 (General Secretary [21]). At the initial stage, there was agreement between the society management, the client and E-Guard, a subsidiary of AHKMT, the service provider for a period of three years, which has been extended for another term of six (6) years till 2021. The services provided include door-to-door municipal waste collection, segregation, waste transportation and its disposal at CDA designated waste disposal site and it does not include street sweeping and cleaning of open areas in the case project area. Charges for these services are Rs.250 per household, as in [20].

In the initial period of the project, only 25% (1.25 tons) of the total collected waste (5 tons) used to be segregated and rest 75% (3.75 tons) used to be disposed off at CDA waste disposal area, which increased operation cost on the one hand and made the waste handling complicated and cumbersome on the other hand, as in [5].

Learning from the field experience of working with communities for handling the household waste, negotiations were initiated with the society management by AHKMT to take appropriate measures for reduction of operation cost, reduce the waste quantities to be transported and disposed of and to make the waste management operation sustainable. Thus, the establishment of Integrated Resource Recovery Centre (IRRC) at sector G-15 on 3R's strategy was agreed, for which land-measuring 800 square meters was provided by the society management, as in [5].

7 INTEGRATED RESOURCE RECOVERY CENTRE (IRRC)

Integrated resource recovery centre (IRRC) is an integrated and sustainable municipal solid waste management initiative, normally termed as pro-poor waste management approach (AHKMT, 2016). This initiative has been undertaken in a privately developed and managed residential settlement, as in [5].

7.1 Establishment of IRRC

The Integrated Resource Recovery Centre (IRRC) is a joint initiative of AHKMT, an NGO working in solid waste management in the areas where, there is no formal institutional municipal solid waste management, UN-HABITAT and UN-ESCAPE. The initiative is first of its nature in Pakistan and targets the reduction of severe impacts of inadequate municipal waste management on environment and achieving the UN Sustainable Development Goals for future clean and healthy environment, as in [5].

7.2 Hurdles in the establishment of IRRC

Establishment of IRRC at sector G-15 is first such an initiative of its kind in Pakistan and therefore, there were fears and doubts about its operation and sustainability, revolving around the issues like availability of land, fears of odor from the compost setup, approvals of the government such as EIA and financial viability issues on account of lower quantities of municipal waste attributed to less number of constructed housing units in the sector G-15 as in [5].



7.3 Municipal solid waste processing mechanism at IRRC

7.3.1 Municipal waste collection

Municipal solid waste is collected by a small sanitary staff- known as e-guards and fleet of three lorries. The households in the project area are provided with two color bins, one for organic waste and one for other waste. The e-guards collect, segregate and process the municipal waste, as in [5].

The segregation of collected waste is undertaken at IRRC facility primarily into three categories such as organic/bio waste/green waste, recyclables and other waste. Organic waste is major component of collected waste that is about 60%, as in [5], which is processed at IRRC facility.

7.3.2 Processing of organic waste

After segregation, organic waste is collected in perforated boxes specifically designed for waste composting thus allowing easy access of oxygen and drainage of excess water. It also requires lesser space as compared to other composting techniques.

There are 12 perforated composting boxes at IRRC Islamabad where the waste remains for 45–50 days prior to its transfer to maturing boxes. The waste is kept for another 15 days in mature boxes within controlled temperature, observed and noted carefully by the specialist staff as in [5]. After this entire process, the dry compost is debased through a manual strainer drum and fine compost is packed for sale in the market after its quality testing by Arid Agriculture University Rawalpindi, as in [5].

7.3.3 Leachate management system

A considerable amount of wastewater is produced during the composting process and cleaning of the premises. This wastewater is stored in an underground tank instead of discharging into open drains. This wastewater is later on reused to maintain the moisture level in new piles and enrich the decomposition process by mixing it with fresh water, thus saving the ground water resources, as in [5].

7.3.4 Economic benefits

Recovery of recyclables and conversion of organic component of municipal waste into compost results in diversion of large quantity of solid waste from landfill. Presently, out of total municipal waste collection of 5 tons in the project area, 60% organic component (3 tons) is converted into compost, 25% municipal waste in terms of recyclables (1.25 tons) are recovered and only 15% (0.75 tons) is transported to the waste disposal site. This situation results in long life of existing landfills, reduces the need of new landfill, saves the waste handling cost of this major portion and therefore, saves money in the long term, as in [5].

7.3.5 Social benefits

Establishment of IRRC from the stage of waste collection to sale of recyclables and fine compost creates employment opportunities as well. Currently, 12 people have been employed as manager, supervisor, coordinator, mali, security guard, sanitary worker, 2 e-guard workers, 3 drivers with three vehicles and one supervisor, with a safe working environment and a safe and secure livelihood, as in [5].



7.3.6 Environmental benefits

Environmental benefits of establishment of IRRC include reduction of greenhouse gas emission by treatment of organic fraction of waste; which can evade spread of bad odor, as well as formation of leachate water and spread of diseases in open dumps.

According to IRRC management, IRRC is a tested model in various countries like Cambodia, Sri Lanka and Viet Nam. IRRC model is tested as pilot project in Islamabad and its replication is expected in other cities of Pakistan, as in [5].

8 SUSTAINABILITY OF THE IRRC INITIATIVE

The financial sustainability of the initiative has been ensured through minimal waste collection charges of Pak Rupee 250/= per household in G-15 sector, the area served by IRRC. Moreover, revenue is collected through sale of material recovered from recycling. The high quality natural manure that is produced from composting is sold to horticulturists and farmers. It also make ups one of the good revenue sources. Income generated from the above mentioned sources is sufficient enough to meet all the expenses to run the social business and make it financially sustainable, as in [5].

9 SATISFACTION OF THE RESIDENTS ABOUT THE SERVICES PROVIDED BY IRRC

For the purpose of having satisfaction of the residents on the performance of AHKMT and establishment of IRRC in the case study area, random household survey (350 households) has been carried out. Also, society management has been interviewed for their viewpoint on performance of Social enterprise for provision of cost effective municipal waste management service. 90% of the surveyed households showed satisfaction on door-to-door waste collection at such a lower price and they have no problem on establishment of IRRC near the settlement, instead it facilitates the availability of sanitary workers in odd timings. However, they had reservation on quality and quantity of street sweeping and cleaning of open spaces. Additionally, the waste management operation could be more environments friendly if better designed waste collection vehicles were used. Further, the interviewees have opined that on account of effective recycling mechanism, movement of free-lancer scavengers in the streets could be controlled.

The society management is satisfied with the improvement of municipal waste management in the scheme at a lower price and the reduced number of complaints from the residents regarding the door-to-door waste collection but worried about increasing number of complaints for inappropriate street sweeping. And the society management is working to broaden the scope of the project, adopting a total solution approach to address complete range of municipal waste management issues. According to the program manager of Arif Hameed Khan Memorial Trust (AHKMT), NGO custodian of IRRC operation, the initiative is a success story to the extent of its defined domain in terms of door-to-door waste collection, recovery of recyclables (25%), composting of organic waste (60%) and reduction of waste quantities transported to the waste disposal site in addition to economic, social and environmental benefits of Integrated Resource Recovery Centre (IRRC).

10 CONCLUSION AND RECOMMENDATIONS

High percentage of organic waste in Islamabad and availability of compost as a replacement of expensive chemical fertilizer makes the waste composting a cost effective and environment friendly option for sustainable solid waste management.



Establishment of Integrated Resource Recovery Centre (IRRC) in a settlement where there is no public-sector arrangement for management of municipal solid waste is a successful example of effective, efficient and sustainable municipal waste management by a social enterprise- third sector in terms of provision of service and establishment of eco-business. This joint venture of social enterprise, private sector and community has come up with a model to share responsibility, provision of urban services, share and lessen the burden on resources of the authorities concerned in public sector, creation of jobs and reasonable earning in the setup. This model may be replicated with modified local arrangements with holistic approach to address the subject of municipal waste management, especially in the areas where there is no arrangement for provision of urban services in public sector. These areas are developments situated in the suburbs of Islamabad and planned, developed and to be maintained by private sector. Provision of urban services, including municipal waste management in these settlements is usually inadequate and inappropriate, so the residents are more vulnerable on account of non-existence of formal arrangement for provision of urban infrastructure and poor monitoring of the concerned authorities. This state of affairs creates space for social enterprise or third sector to perform at competitive costs ensuring provision of sustainable urban services and experiment resource generating models.

In order to fill this gap, IRRC model experimented in a settlement in private setup in the hand resource generating provision of urban services in the settlements around the city where there is no formal and regular provision of urban services or supplement the existing substandard urban services. However, the model needs to be modified taking into consideration the local situation in terms of institutional arrangement for provision of municipal services, availability of funds, institutional monitoring, existing arrangements and will for innovations. Necessary legislation should be made immediately, if is warranted to ensure cost effective and sustainable municipal waste management in the settlements at larger scale where there is no regular public service.

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