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RESEARCH NOTES

CHILDREN AS SCAVENGERS (RAG PICKERS): A Case of Karachi

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I. Introduction

In developing countries, the emerging mega cities face a number of interlinked issues, such as, increased flow of trading activities (particularly in the coastal cities), expansion in manufacturing and service sectors (because of a relatively developed infrastructure). As a combined effect of these factors there is a significant increase in population from within and neighboring countries. The situation aggravates even further when the huge influx of population exerts enormous pressure on limited physical and social infrastructure of a city. The obtained situation is thus observed with increased environmental degradation and significant rise in poverty levels.

The coastal city of Karachi which is the largest city of Pakistan is now considered as one of the ten biggest mega cities in the world and appears as a classic case of such type of expansion in its size of population. As per the last population census of 1998 in the country, Karachi had a population of 9.8 million (though controversial). In absence of the new population census which was due in 2008, different estimates suggest that the current population size of Karachi city would be around 20 to 25 million. Along with the population growth, an average income level of its inhabitants has also caused upward shifts in consumption expenditures. The simultaneous raise in production of solid waste, as an outcome of improved standards of living and increased business activities, has impaired the city's institutional capacity to properly dispose off and recycle the solid wastes. In the obtained situation, the remaining part of solid waste is disposed off and recycled by the private sector.

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Since there are no clear policies and well defined role for the private sector's participation in this regard, the process followed has remained informal, unscientific and exploitative. These three aspects have caused major bottlenecks towards development of a productive and sustainable system of solid waste management with active participation from private sector.

First, the level of informality followed in absence of a well-defined set of rules to be introduced by the government has neither provided any information on its scale of operation and procedures followed, nor have helped in expanding the tax resource base for the government. As a consequence of this tendency, a new avenue for tax evasion has been introduced; whereby, some of the formal units of producing sector in particular have been following a path to bifurcate their units into formal and informal units. Since, labour laws are not strictly followed or applicable, in most cases the labour cost is reduced by employing the child labour.

Second, by maintaining informality the operating units are not registered and thus not brought under the existing environmental laws, as well. In the obtained situation environmental degradation is always an expected outcome which adversely affects the working environment in which labour works, particularly the child labour. Third, because of the lack of transparency in approaches followed by the private sector, occurrence of child labour and their exploitation remains hidden in the glorified notions of cost effectiveness. These tendencies, in turn, reflect breach of laws, lack of respect to human dignity, loss of goodwill in the international markets and above all, societal insensitivities towards growth and development of its youth.

In view of the above mentioned weaknesses and constraint demand for child labour for solid waste management is generated. On the other side, the widespread poverty in Pakistan, particularly during the last 10 years (caused by low investment and subsequent higher level of unemployment) has tended to supply surplus labour (including children of age 18 years and below) in response to the growing demand for labour in solid waste management. As obvious, a larger focus and concentration of economic activities in the informal sector provides a congenial environment in pursuit of higher level of cost effectiveness. Given the budgetary constraints which coupled with institutional weaknesses of public sector institutions in most of the developing world, it is not surprising to observe significant expansion and growth of informal sector in mega cities. The city of Karachi is not an exception in this regard, where a persistent population growth rate of over four per cent annually has been recorded over the last 50 years.

Under this study, efforts were made to assess and analyze different forms and manifestations of child labour in the informal economic activities in the largest city of Pakistan, i.e., Karachi. It has facilitated in providing an opportunity to focus and assess the rising but badly neglected case of scavengers (rag pickers) who silently operate all over the city in removing garbage and solid waste, and plays a pivotal role in extracting the reposed economic benefits.

1. Incidence of Child Labour as Scavenger in Karachi and Organization of Work

In this study, an assessment of scavengers working informally in Karachi city was undertaken. Due to complete lack of information on children working as scavenger in almost all public data gathering exercises in Pakistan (e.g., Labour Force Survey, Census of Manufacturing Industries, Economic Survey), it became rather challenging to gather data on scientific basis. With this in view, a complete randomized approach was followed for a survey of scavengers using a structured questionnaire.

A sample survey of 150 scavengers was initiated covering all districts within the jurisdiction of Karachi metropolis. Attempts were also made to cover most areas of the city in order that the data collected remains representative of scavengers operating in different localities. Of the total of 150, the survey yielded 149 cases where complete information was provided by the respondents, i.e., scavengers. The survey was conducted at the work places of scavengers (i.e., on streets, waste dumps and at places (site of local contractors) where they sell the collected material on daily basis. The working children were interviewed in a friendly manner in order that they are not sensitized. It was pleasant to note that the working children were confident while being interviewed-perhaps they had a notion that at least their work of collecting waste material from domestic, industrial and trading sectors was not an illegal activity. Rather, it was a favor to those who create the mess and throw outside their premises without any head to their moral and legal responsibilities.

The process followed by scavengers is based on collection of solid waste (mostly from streets) and its sale to the nearest vendors (i.e., the local petti contractor) on a daily basis with whom they have an unwritten and informal but effective agreement. Some of them also carry the task of sorting out the material based on the categories as determined by the contractor for which additional payment is made. The payments are made in cash with some notions of deferred payments reflecting factor-product interlocking, though it was not reported in significant proportions.

The prices paid by the contractors vary by type of material and on the basis of weight. Though the average price level of the material purchased do vary over time but price is determined by the contractor without even mutual consent of the scavengers. Since there is no formal and/or legal framework to determine prices, it appears as a collusive behavior on part of the contractor in determining price at the market level for the waste materials they purchase. Therefore, there are notions of a market based exploitation of these scavengers by the contractors.

Another important aspect related to the issue is to the modality of supply of working children as scavengers. In certain cases, it appears that either parents or a supplier (with or without consent of parents) supply these children from rural areas to the contractors in the city and largely controls their income. Since this aspect was least observed in case of scavengers, the assessment being presented here does not cover it but in case of working children in other ventures in the city this aspect seems prominent.

The working environment for the scavengers, however, seems more relevant in highlighting the exploitation of these workers. The work, whether carried out on streets or at contractors' work-place, is performed under extreme weather conditions. The scavengers are neither protected by the contractors nor by the state. They work under severe weather conditions without any protection from heat, cold, dust, noise, cuts and wounds. The work is carried out without a head gear or proper shoes or gloves. In case of an injury there is no immediate medical care. Even the government hospitals and health care units charge a fee, as a result of which most of these children either do not go for treatment or pay from their limited earnings. It is generally regarded that an average life span of these workers is around 30 years as a result of chronic diseases like cholera, hepatitis, respiratory problems, genital discomfort, etc., they catch from the environment in which they work.

There is, however, a new arrangement initiated rather recently, in the city where child labour working as scavenger is better managed. This consists of small scale private entities working in middle and upper middle class localities, and use scavengers in collecting household solid wastes on a daily basis and charge a monthly fee. The work is closely supervised by employers of these children who are paid a fix salary under an unwritten personal (but not legal) contract. This type of arrangement does provide a job security (so to speak) to the children involved but also reflect exploitation on a financial basis. Though the arrangement is new, the inelastic supply of solid waste indicates possibility of exploitation of scavengers. Given the fact that this arrangement covers only a part of the city, this very aspect was not included in this study. However, any future work on the subject needs to focus closely on the likely economic and social impact of new arrangement.

II. Empirical Assessment

Under this study a field survey of 150 scavengers was carried out to assess working conditions and the organization of production pertaining to different aspects related to child labour. The survey followed a random approach and covered various localities in all districts of Karachi city, thereby, covering scavengers who collect domestic and services sectors solid waste, on daily basis. Of those 150 scavengers, information on 149 cases was used for analysis (in one case full information was not provided and that case was dropped).

1. Profiles of Scavengers

The survey results depict numerous aspects and characteristics of scavengers which are presented (Table 1). The current status of these working children is ascertained.

TABLE 1

Variables and Attributes related to Scavengers

Variables		Attributes
	Own Profile:	
1.	Age	7 – 18 years
2.	Gender	148 Boys, 1 Girl
3.	Origin	32.9% from Karachi, 42.9% from other Provinces, Afghanistan 24.2%
4.	Origin	32.9% from Karachi, 42.9% from other Provinces, Afghanistan 24.2%
5.	Years of Scavenging	0.5 – 10 years
6.	Wages	Rs. 15 – Rs. 600 per day
7.	Education	0 – 5 years
	Family Profile:	
1.	Family Size	4 – 19 members
2.	Number of Earners	2 – 8 earners
3.	Monthly Family Income	Rs. 4000 – Rs. 37,000
4.	Skills in Family	Over 80% working as Scavengers/ Casual Labor
	Relationship with Family:	
1.	Living with Family	With parents 83.9%
2.	Income Support to Family	81.2%
	Scavenging:	
1.	Distance to work	0.5 to 5 Km
2.	Frequency of Visit to workplace (daily)	
a.	1 Visit per day	(54/149)
b.	2 Visits per day	(77/149)
c.	More than 2 Visits per day	(18/149)
3.	Sorting	(41/149)
	Living Standard:	
1.	Housing type	Pucca Structure 3.5%, Katchha 67%, Mixed 29.5%
2.	Assets held in the Family	
a.	T.V.	17.4%
b.	Washing Machine	10.7%
c.	Iron	16.1%
d.	Fridge	2%
e.	Motor Cycle	3.4%
f.	Bicycle	6%
3.	Access to Civic Amenities	
a.	Electricity	67.1%
b.	Natural Gas	33.6%

(Contd..)

TABLE 1

(Contd..)

Variables	Attributes
c. Tap Water	0%
d. Sewerage	5.4%
e. Schooling	8.1%
f. Dispensary/Clinic	15.4%
Working Environment:	
1. Percentage reporting Insect Bite	33.6%
2. Percentage reporting Excessive Heat	32.2%
3. Percentage reporting Stress	5.4%
4. Percentage reporting contact with Chemicals	12.1%
5. Percentage reporting Physical Damage	18.18%
6. Percentage reporting Dust	81.9%
7. Percentage reporting Direct Sun Light	46.3%
8. Percentage reporting Noise Pollution	37.6%
Percentage Reporting Risk to Health from Working Environment:	
1. Percentage reporting Flu	43.6%
2. Percentage reporting Back Pain	24.2%
3. Percentage reporting Skin rash	39.6%
4. Percentage reporting Eye Problem	17.4%
5. Percentage reporting Fever	27.6%
6. Percentage reporting Cough	15.4%
Aspirations:	
1. % willing to do Scavenging as Career Path	28.9% (43 Cases)
a. % willing to become contractors	(16/43)
b. % hoping for better understanding of live	(15/43)
c. % reporting Scavenging as Better profession	(12/43)
2. % not willing to do Scavenging as a Career Path	50.3% (75 Cases)
a. % willing to do other business	(29/75)
b. % willing to do something else	(13/75)
c. % willing to establishing own transport business	(21/75)
d. % willing to seek other jobs	(12/75)
3. Non responses	20.8% (31 Cases)

2. Descriptive Research

This section of the note presents results of descriptive research highlighting relationship among different characteristics and attributes across two different themes:

Theme-1: Income and Poverty.

Theme-2: Willingness for Persistent Scavenging.

The description of interrelationship presented is based on number if Tables, each highlighting a combination of different attributes of scavengers.

a) Income and Poverty

The results refer to the income level and poverty of scavengers and their households. In poor families, more than one person including children, normally earn for sustenance. By placing a very high rate for discounting their future, the household decides its competing priorities where income earning is regarded more important than education and health improvements. Under such a scenario, some scavengers live away from their parents, as well. The level of efficiency in earning income, i.e., monthly income levels in relation to the average of all earners in the household depends, among other factors, on their state of isolation (implying that they do not live with parents) and their work experience have been highlighted. In order to gauge their efforts, a composite variable was computed where scavenger's monthly income was taken as a ratio of monthly income per earner of his household (including scavenger as an earner). The ratio was computed as under:

Scavenger's Relative Income Ratio = (Av. daily earning x 25)/ (Av. monthly income of family) / # earners.

A lower value of this ratio would mean that, on an average, the scavenger alone is earning a lower wage as compared to that of the family as a whole. Conversely, a higher value would imply that the scavenger is making maximum efforts to earn more. In view of the fact that over 81 per cent of the scavengers interviewed regarded that their income helps the family (discussed in earlier section), this ratio reflects the level of stress and achievement motivation towards income stabilization of the family.

TABLE 2

Scavenger's Relative Earning Ratio by Living Status and Years of Scavenging

(Averages)

Living with Parents	Scavenger's Relative Earning Rate			
	# of years in Scavenging			
	Less than 2 years	From 3 to 5 years	More than 5 years	Total
Yes	120 (59)	0.138 (36)	0.158 (30)	0.134 (125)
No	0.116 (3)	0.174 (14)	0.185 (7)	0.170 (24)
Total	0.120 (62)	0.148 (50)	0.163 (37)	0.14 (149)

Note: No. of observation are in parenthesis.

Table 2 shows that average ratio of 149 scavengers is 0.14 which means that on an average, they earn only 14 per cent of the average earning per earner per month. Whether this contribution is small or not, it is evident from the fact that small age working children do contribute in stabilizing household income level. It shows that this ratio (of relative contribution) increases from a value of 0.12 to 0.163, i.e., by 36 per cent with the experience of working as scavenger. It also shows that those living away from their parents also earn 27 per cent higher income.

Table 3 shows the relationship of scavenger's relative earning ratio with family size and level of education. It shows that this ratio reduces gradually with increase in family size. It further means that larger families do send children to work independent, irrespective what they earn. The relationship with educational attainment does not show any contributory impact of education (only 5 out of 149 had education till primary level) towards income generation.

Table 4 provides further evidence in support of information contained in Tables 2 and 3. It shows positive relationship between the number of earners and family size which vary in determining relative contribution of scavengers towards stabilization of their household income level. Looking at the extreme value of ratio in Table 4, it appears that with increase in the number of earners and family size, the value reduces from 0.19 to 0.069. However, the very existence of the scavenger points the fact that in order to stabilize household income the supply of children for scavenging is likely to continue.

TABLE 3

Scavenger's Relative Earning Ratio by Family Size and Education level

(Averages)

Family Size	Scavenger's Relative Earning Rate		
	Education		
	Illiterate	Primary Pass	Total
Less than 7 members	0.171 (18)	0.094 (1)	0.167 (19)
7 to 8 members	0.138 (30)	- (0)	0.138 (30)
8 to 10 members	0.143 (53)	0.098 (4)	0.139 (57)
More than 10 members	0.130 (43)	- (0)	0.130 (43)
Total	0.141 (144)	0.097 (5)	0.140 (149)

Note: No. of observation are in parenthesis.

TABLE 4

Scavenger's Relative Earning Ratio by Family Earners and Size

(Averages)

# Earners in Family	Scavenger's Relative Earning Rate				
	Less than 7 members	7 to 8 members	8 to 10 members	More than 10 members	Total
upto 2 earners	0.190 (13)	0.201 (10)	0.223 (16)	0.267 (10)	219 (49)
upto 3 earners	0.138 (5)	0.107 (20)	0.125 (29)	0.112 (12)	118 (66)
more than 3 earners	0.017 (1)	- (0)	0.062 (12)	0.075 (21)	069 (34)
Total	0.167 (19)	0.138 (30)	0.139 (57)	0.130 (43)	0.140 (149)

Note: No. of observation are in parenthesis.

The preceding discussion provides evidences to suggest that poverty does not only exist but is likely to cause continuity in supply of children as scavenger. It further implies that unless and until the process of disposal and recycling of solid waste is organized in a scientific manner, the unabated supply of children will continue to haunt the future of poor children and their economic exploitation and social stratification will create further injustice in the society.

Of the total 149 cases, nearly two-third had permanent addresses outside Karachi city. Out of these, a vast majority (24.1 per cent) of 100 children came from KPK while another 24.2 per cent came from Afghanistan. The scavenging of solid waste in the metropolis of Karachi thus appears to be an outcome of poverty which is quite wide spread. Table 5 shows the average monthly income of scavengers who came from within Karachi was Rupees 3,918 per month which exceeded only by 5 per cent in relation to those who came from outside Karachi.

The distance to work place has an economic cost either in terms of conveyance cost or time loss. The table shows that 26 out of 100 scavengers who came from outside Karachi had their work place at a distance of over 2 kilometers, while only 14 per cent of those from within Karachi had to travel long distance. The data shows that longer distance to work place tends to reduce average income levels. It also shows that the local-based scavengers earn less if distance to work place increase and the migrant workers tend to stabilize their income, even if they have to travel too longer distances.

Similar to the findings presented in Table 5, the pattern depicted by Table 6 implies that a greater proportion of migrant workers take more stress to visit waste collection places multiple times on a daily basis than the local workers. This depiction is also consistent with the behavioral changes observed in migrant workers, all over the world, i.e., a higher level of achievement motivation in relation to locals.

TABLE 5

Scavenger's Average Monthly Income
by Origin and Distance to Work

(Averages)

Origin	Average Monthly Income (Rs./month)			
	Distance to Work			
	upto 1 km	1 to 2 km	more than 2 km	Total
Outside Karachi	3976	3620	3716	3738
	(26)	(48)	(26)	(100)
Karachi	4117	4245	2232	3918
	(15)	(27)	(7)	(49)
Total	4027	3845	3402	3797
	(41)	(75)	(33)	(149)

Note: No. of observation are in parenthesis.

TABLE 6

Scavenger's Average Monthly Income
by Origin and No. of Visit for Waste Collection

(Averages)

Origin	Average Monthly Income (Rs./month)			
	Frequency of visits			
	One visit	Two visits	more than 2 visits	Total
Outside Karachi	2835	3786	4969	3738
	(25)	(59)	(16)	(100)
Karachi	3733	4167	4375	3918
	(29)	(18)	(2)	(49)
Total	3317	3875	4903	3797
	(54)	(77)	(18)	(149)

Note: No. of observation are in parenthesis.

A group of the scavengers also carry out the activity of sorting out the materials which they sell to the contractors. The sorting by classifying the material into papers, plastics, metals, glasses and other items at the discretion of the contractors is also an activity that creates stress and is also hazardous but almost doubles the income levels. Those involved in sorting activity also demonstrate higher levels of achievement motivation.

Table 7 shows variation in the income level with and without undertaking the work of sorting; whereas, the average levels of monthly income generated by migrants and local workers carrying out the sorting seems competitive. It is also evident that the proportion of local workers is almost twice than that of migrants in that group. Contrary to this assertion the group who undertake only the work of collection, depicts that on an average, migrants earn 20 per cent more than the locals. It appears that the locals enjoy a greater control in relation to migrants and face relatively less stress in generating income through solid waste collection and it's sorting.

TABLE 7

Scavenger's Average Monthly Income by Origin and Sorting

(Averages)

Family Size	Average Monthly Income (Rs./month)		
	Do you do the sorting as well?		
	Yes	No	Total
Outside Karachi	5739	3173	3738
	(22)	(78)	(100)
Karachi	5987	2608	3918
	(19)	(30)	(49)
Total	5854	3016	3797
	(41)	(108)	(149)

Note: No. of observation are in parenthesis.

The assertion of income earnings with and without sorting was also viewed in relation to monthly total family income. The descriptive information discussed in Section 3.1 showed that a significantly larger proportion of other earners in the families of scavengers were also scavengers. It will thus not be surprising to note that scavengers (i.e., the interviewees) who carries out sorting as well, were associated with higher income families. Almost, similar pattern exist in the case of those who do not carry out sorting and earn a lower level of income.

What appears from above is the indication of a culture of scavenging which attracts the poor unemployed persons who consider access to the profession of scav-

enging for income generation, much easier as compared to all other avenues, despite knowing the long-term consequences on health and productivity levels. As mentioned earlier, these poor families have no option but to discount their future heavily and grab whatever is available to them at present. This is the primary and biggest weakness which can be exploited. At this juncture the state has to intervene to save the poor from exploitation.

The private sector entities, running the work of disposal and recycling of solid waste considers it an opportunity to optimize benefits through exploiting these poor families by perpetuating the informal character of their activities. In the supply chain which ultimately converts the solid wastes into finished or semi-finished products, the major investors seemingly keep themselves out of picture through direct and indirect arrangements, partly to save themselves from violation of labour laws and environmental guidelines or through bifurcating their investments into formal and informal activities to evade taxes or both. Under the glorious notions of cost effectiveness, propagated in the international market by its operators, seems to have thoroughly convinced the developing world that their only edge is reposed in cheap labour cost. The response from policy makers in developing countries, in the wake of child labour use and abuse in this very context is yet to evolve.

TABLE 8

Scavenger's Average Monthly Income by Sorting and Family Income

(Averages)

Do Sorting as well?	Scavenger's Relative Earning Rate					
	Family Income (Rs./month)					
	0 to 5000	5001 to 10000	10001 to 20000	20001 to 30000	30001 & Above	Total
Yes	2500	5143	6155	8438	2500	5854
	(1)	(14)	(21)	(4)	(1)	(41)
No	1864	2631	4250	5000	-	3016
	(11)	(67)	(28)	(2)	(0)	(108)
Total	1917	3065	5066	7292	2500	3797
	(12)	(81)	(49)	(6)	(1)	(149)

Note: No. of observation are in parenthesis.

b) Willingness for Persistent Scavinging

The level of disillusionment, (caused by poverty, lack of educational facility, deteriorating health conditions and above all a complete lack of social protection), leaves no option for the scavengers but to continue collecting solid waste despite

harsh and inhuman conditions in which they operate. Under these circumstances these working children consider maximization of daily earnings as the only mode of survival. With this in view, the analysis presented in this note focuses on average daily earnings and attempts to relate to some other aspects like age, intensity in work measured in terms of distance travelled and frequency of daily visits, hazards faced considering scavenging as a career path.

Table 9 highlights the benefits of persistence in scavenging which is evident through variations in daily earnings. It shows a consistent rise in daily income in not being selective in waste collection. It implies that those scavengers who do not attach any importance to the hazardous nature of waste and tends to collect as much as possible and increase their daily earnings, as compared to those who are relatively more selective and restrict themselves to fewer types of waste. The table also reflects the fact that persistency in scavenging (i.e., higher experience in scavenging) provides significant growth in daily earnings.

It appears that (Table 10) there is a negative value added to education in scavenging and though it would be difficult to generalize this assertion, due to fewer cases of scavengers who have education up to primary level (i.e., only 5 out of 149 cases). Nevertheless, the impact of education on daily earnings cannot be regarded as insignificant in the sample under review. The factor of age seems extremely significant in altering the level of daily earnings. It further signify the premium on age and thus, persistence in scavenging. The mere fact that children under 9 years of age fetch one-third of what the children of 15 years or more would do, reflects that small age instead of acting as a constraint actually highlights scavenging as a path towards their career building.

TABLE 9

Child Wage per day by Scavenging years and Type of Waste Collected

(Averages)

# of years in Scavenging	Child Wage per day					
	Type of Waste collected					
	1	2	3	4	5	Total
Less than 2 years	69	89	101	200	-	112
	(4)	(15)	(33)	(10)	(0)	(62)
From 3 to 5 years	120	109	157	116	140	145
	(1)	(8)	(35)	(4)	(2)	(50)
More than 5 years	167	200	228	250	250	228
	(3)	(2)	(20)	(11)	(1)	(37)
Total	112	104	152	209	177	152
	(8)	(25)	(88)	(25)	(3)	(149)

Note: No. of observation are in parenthesis.

The level of stress faced in travelling longer distance for waste collection and its impact on daily earnings is highlighted by Table 11. It clearly shows that stress defined tends to reduce daily earnings, but children under age 9 are the worst sufferers in relation to higher age groups. This tendency attaches involvement in scavenging at early age as a notion of investment in future by younger children and their parents. Therefore, the persistence in scavenging keeps building the hope for higher income in future.

TABLE 10

Child Wage per day by Education and Age Group

(Averages)

Education	Child Wage per day			
	Age Group			
	Upto 9 years	10 to 14 years	15 & Above	Total
Illiterate	85	135	224	153
	(17)	(88)	(39)	(144)
Primary Pass	50	150	150	110
	(2)	(2)	(1)	(5)
Total	82	136	222	152
	(19)	(90)	(40)	(149)

Note: No. of observation are in parenthesis.

TABLE 11

Child Wage per day by Distance to Work and Age Group

(Averages)

Distance to Work	Child Wage per day			
	Age Group			
	Upto 9 years	10 to 14 years	15 & Above	Total
Upto 1 km	100	128	264	161
	(5)	(25)	(11)	(41)
1 to 2 km	76	146	208	154
	(12)	(40)	(23)	(75)
More than 2 km	70	126	200	136
	(2)	(25)	(6)	(33)
Total	82	136	222	152
	(19)	(90)	(40)	(149)

Note: No. of observation are in parenthesis.

In pursuit of higher incomes, these working children take higher stress by visiting collection places intensively in order to maximize their daily earnings. At the same time, the level of disillusionment over career path also affects their levels of achievement motivation. This is reflected by table 12 which shows that those who foresee any career path in scavenging i.e. 43 out of 149 (i.e. 29 percent) tend to earn 22 per cent higher income per day as compared to those who do not foresee any career path but continue scavenging which they find as their only resort currently available to them.

In any moment of despair, a ray of hope towards improvement often tends to slow the level of efforts being made to achieve certain goals. Therefore, an assurance towards the continuity in the current work through a contract may reduce the level of achievement motivation of workers in a situation where the majority does not consider scavenging as a career path, any way. Table 13 reflects this tendency where those without a contract pay more frequent visits to place of collection in pursuit of higher incomes in relation to those with a contract.

III. Regression Results

In continuation with the earlier descriptive analysis on the themes related to income and poverty, and willingness for persistence scavenging, this section presents results of multivariate analysis with the themes. The regression analysis uses OLS method to measure the expected level of relationship among pertinent variables discussed earlier and the thematic variables.

TABLE 12

Child Wage per day by No. of visit for Waste Collection and Career Path

(Averages)

Frequency of Visit	Child Wage per day		
	Foresee any Career Path?		
	Yes	No	Total
1 visit	169	122	133
	(12)	(42)	(54)
2 visits	180	143	155
	(25)	(52)	(77)
3 visits	167	211	196
	(6)	(12)	(18)
Total	175	143	152
	(43)	(106)	(149)

Note: No. of observation are in parenthesis.

TABLE 13

Child Wage per day by Contract Basis Status and No. of Visit for Waste Collection

(Averages)

Contract Basis	Child Wage per day			
	Frequency of Visit			
	visit 1 time	visit twice	visit more than 2 times	Total
Yes	100	172	400	145
	(14)	(14)	(1)	(29)
No	144	151	184	154
	(40)	(63)	(17)	(120)
Total	133	155	196	152
	(54)	(77)	(18)	(149)

Note: No. of observation are in parenthesis.

1. Income and Poverty

The results of descriptive research under the theme of income and poverty presented in the preceding section highlighted relationship between a number of attributes/variables with SRER, i.e., scavenger's relative earnings ratio and the MIS, i.e., monthly income of scavengers. This section shows results of regression analysis where SRER and MIS were taken as dependent variables and regressed against variables that are expected to impact on these dependent variables.

Tables 14 and 15, highlight results of these two regression equations. Table 14 shows robust results where SRER is affected significantly by factors like working experience, number of earners in the family, frequency of visits to working place, pre day. It implies that stress on the child to work as scavenger will be reduce significantly if the number of other earning members in the family are sufficient enough to stabilize family income. It further implies that stress from family on the scavenger to increase his earning capacity is strongly linked to joint earning capacity of the family (measured by number of earners). It also shows that working experience as scavenger helps in raising earning level, as a result of which the relative share of scavenger earning in the family increases. The other factor explaining intensity of visits to work actually tends to reduce the earning levels. These factors show statistically significant relationship with SRER, i.e., scavenger's relative earnings ratio. All indicators of the test of significance of regression equation show statistically significant estimation.

TABLE 14

OLS – Estimates (Dependent Variable: Scavenger's Relative Earning Ratio)

	Coefficient	p-value
EPM	-0.02	0.75
Working Experience	0.01	0.00*
# of Earners	-0.06	0.00*
Frequency of Visit to Work	-0.01	0.04**
Living with Parents	-0.01	0.46
Constant	0.30	0.00*
Number of Observation	149	-
F-Statistics	15.24	-
Prob. F-Test	0.00	-
R-Square	0.50	-

Note: *, **, *** represents significant at 1%, 5%, and 10%, respectively.

The results of another estimated regression model where monthly income of scavenger was related to origin distance to work, frequency of visits and activity of sorting show that a fierce competition prevails where origin of scavengers and variability in the net impact on income level significantly affects incomes (Table 15).

TABLE 15

OLS – Estimates (Dependent Variable: Monthly Income of Scavengers)

	Coefficient	p-value
Origin	-97.45	0.76
Distance to Work	-104.11	0.51
Frequency of Visit to Work	384.11	0.10***
Sorting	-2690.46	0.00*
Constant	7971.01	0.00*
Number of Observation	149	-
F-Statistics	16.25	-
Prob. F-Test	0.00	-
R-Square	0.34	-

Note: *, **, *** represents significant at 1%, 5% and 10% respective.

However, frequency of visits and involvement in the activity of sorting tends to influence monthly income in a statistically significant manner. Specifically, a higher intensity, i.e., number of daily visits to work place, on average, increases monthly income by Rs.384/-, and by carrying out sorting activity the scavengers are likely to earn an additional income of Rs.2,690 per month. It appears from the analysis that poverty level of households, who supply child labour for scavenging, is generally higher enough to compel the scavengers to take extra stress in boosting their income levels. Since, over 80 per cent of the scavengers interviewed under the study revealed that their income tends to support their family income level. It is clearer that the supply of child labour from poor families is a testimony of their poverty level and they are likely to continue supplying children to stabilize their consumption level.

2. Willingness for Persistent Scavenging

The act of scavenging has a deeper root in poor families where lack of education/ skills, access to health facilities and living conditions compel the family members to earn as much as possible irrespective of whether the act is likely to provide any skill, based on which they can improve their living conditions more appropriately or not. The despair and disillusionment thus created, leaves no other option for these poor families but to remain persistent in scavenging as a mark of distinction for the family. With this in view, persistence in scavenging was tested through regression analysis using a number of possible factors as highlighted by Table 16. The results show that distance to work, frequency of visits or any contract base employment assuring certain guarantees do not

TABLE 16

OLS – Estimates (Dependent Variable: Daily Wages of Scavengers)

	Coefficient	p-value
# Waste Collected	23.64	0.01*
Distance to Work	-9.72	0.11
Working Experience	19.39	0.00*
Education	-10.30	0.04**
Frequency of Visit to Work	10.79	0.28
Contract Basis	-3.40	0.82
Career Path	-31.27	0.06***
Constant	40.20	0.20
Number of Observation	149	-
F-Statistics	19.74	-
Prob. F-Test	0.00	-
R-Square	0.40	-

Note: *, **, *** represents significant at 1%, 5% and 10% respectively.

impact statistically on the level of daily wages earned by scavengers. The factors that appear statistically significant in altering the wages include number of wastes collected (i.e., irrespective of hazardousness of the items being picked up), work experience in scavenging, being away from schooling, and presence of a vision in determining a career path appear as significant factors in perpetuating scavenging as a career path.

IV. Contractors' Assessment

In view of the fact that the scavengers converge to local contractors on a daily basis to sell the collected material, an assessment of local contractors was undertaken to unfold the supply chain further using child labour in solid wa ste management. The scavengers normally operate within 5 kilometer radius where they sell the collected materials to local contractors under an informal/unwritten tacit agreement. The buyers, i.e., contractors usually form a cartel in stabilizing/controlling the product prices. This imperfection in the market leads to unilateral fixation of prices of the material collected by scavengers by the contractors without any role to be played by the suppliers, i.e., the scavengers. Since the scavengers have no or little say in price determination, they normally converge to specific contractors with whom they have an understanding. Though, there are no apparent signs of factor-products interlocking in the system and as such, no advance payment is made to scavengers by the contractors, the unilateral price fixation of solid wastes collected by scavengers, nevertheless, does point towards exploitation of scavengers at the hands of these contractors.

A survey of scavengers was undertaken with the help of 19 contractors covering major areas of the Karachi city from where. These contractors sort their purchases after and sell them to bigger contractors who in turn supply these to various mills and industries. Since there was no direct working relationship of scavengers with big contractors, further coverage of other types of contractors was made for this study. The basic characteristics of 19 contractors are as follows:

1. Out of the total, 12 contractors were of medium size whereas 7 were of small size.
2. Of the total 19 surveyed, 18 were established in shops and only 1 was established within the residence of the contractor.
3. All the contractors were dealing in materials like plastics, paper, whereas the rest were purchasing materials like copper, iron, steel, glass, animal bones, bottles, card board boxes etc. in different proportions.
4. On average, each contractor had 16 workers with a maximum of 50 workers.
5. On average, 57 percent of these workers (with a maximum of 80 percent) were of age 18 or below.
6. Nearly 30 percent of the workers started working as scavengers before attaining 18 years of age.
7. The average working experience of these contractors was 12 years which ranged between 6 and 19 years.

8. The average daily turnover of these contractors was 17.5 tons of solid wastes within a range of 1 to 77 tons.
9. Almost all these contractors were engaged in sorting, grading, packing and bundling before supplying to bigger contractors or factor markets.
10. Nearly 79 per cent of these contractors did not depend on their family for the collection of solid waste.
11. Nearly 42 per cent of these contractors worked earlier as scavengers.
12. Over 68 per cent of these contractors were not aware of their health hazards associated with collection of solid waste.
13. From the total of 15 reported cases 7 were of skin diseases, 3 of allergy, respiratory problems and 2 of fever.
14. All 19 contractors confessed of not providing any safety measures and protection plan for the scavengers.

The descriptive analysis focus on measuring average daily supply of materials by children working under 18 years of age and relating it with the variability across size of firms and intensity in the use of child labour. The analysis was carried out separately for hazardous and less hazardous materials. The hazardous materials included copper, steel, iron, glass and bottles, whereas the less hazardous material comprised paper, plastics, wooden boxes, card boards and animal bones. Table 17 highlights average collection of hazardous material by children under 18 years and its supply to the contractors, measured in terms of kilograms per day per child, and its level of relationship with size of firm and the intensity of using child labour in the process.

TABLE 17

Collection of Hazardous Materials Per Day Per Child
Across Size of Firm and Intensity of Use of Child Labour

(Kilograms)

Ratio of Child Labor	Collection per Day per Child – Hazardous		
	Size of Premises		
	Medium	Small	Total
Up to 50 %	12.02	8.05	11.03
	(6)	(2)	(8)
50 to 75 %	11.02	14.88	12.73
	(5)	(4)	(9)
75 % and Above	20.00	6.67	13.33
	(1)	(1)	(2)
Total	12.27	11.75	12.08
	(12)	(7)	(19)

Note: No. of observation are in parenthesis.

It shows that the use of child labour for collection of hazardous waste is significantly high, i.e., 8 contractors out of 19 (42 per cent) reported that proportion of child labour is under 50 per cent. In the next category, the proportion of child labour is even higher, i.e., 9 out of 19 (47 per cent). It also shows that an average level of collection increases with an increase in the intensity of using child labour.

Table 18 portrays a similar framework to observe the situation with regard to less hazardous material. It shows a set of relationship somewhat contrary to what was observed in case of hazardous materials discussed above. It reflects that average level of collection per child tends to decline with increase in the intensity of using child labour. The larger size firms receive larger contributions on a per child basis.

The above analysis leads to another aspect of waste collection. The hazardous waste is largely collected from residential areas where streets are generally dirty which make the mobility more difficult for collectors. In contrast, less hazardous material, particularly papers and boards are primarily available around markets and offices where the streets are relatively less dirty and more spacious. Therefore, it is not surprising to observe that average collection of hazardous material by children increase with firms depending more on children, whereas in case of less hazardous material the pattern tends to be reversed. What this peculiarity tends to suggest is that children working under 18 years are at a disadvantageous position to accept the dirtiest option available to them. This selective bias against working children represents another view of exploitation.

TABLE 18

Collection of less Hazardous Materials per Day per Child across size of Firm and Intensity of use of Child Labour

(Kilograms)

Ratio of Child Labor	Collection per Day per Child – less Hazardous		
	Size of Premises		
	Medium	Small	Total
Up to 50 %	50.77	28.64	45.24
	(6)	(2)	(8)
50 to 75 %	45.63	53.33	49.06
	(5)	(4)	(9)
75 % and Above	42.31	19.44	30.88
	(1)	(1)	(2)
Total	47.92	41.44	45.53
	(12)	(7)	(19)

Note: No. of observation are in parenthesis.

V. Conclusions

The evidence highlights that child labour does not only exist in the process of solid waste management in the metropolis of Karachi but it occupies a pivotal position in collection and supply of solid waste. The organization of production tends to put the scavengers in the worst form of working conditions by not assigning any legal, physical or financial protection. The notions of cost effectiveness are suitably used to employ young age children, i.e., below 9 years of age, which is a clear violation of the existing labour laws of Pakistan. Furthermore, there is a clear disconnect with the existing environmental laws of the land. These violations seem interdependent on each other in the process of solid waste management where achievement of labour cost effectiveness is based on exploitation of child labour. The level of abject poverty coupled with in migration of workers in the city constitutes the sources of supply in the management of solid waste in Karachi city. The demand for cheap labour is facilitated by the glorified notions of cost effectiveness floated in domestic and international markets. The statistical test also tend to reinforce the fact that households supplying children as scavengers are left with no other option, and in a state of despair and disillusionment accord scavenging as career path are the only way to survive.

The assessment of contractors' organization of work testifies use of child labour in collection and sorting activities of solid waste in significant proportions. It showed that per child collection of hazardous waste like copper, steel and iron increases with the increase in the proportion of working children in the total labour involved. In case of less hazardous materials like paper, wooden articles and animal bones, however, the level of collection was higher where the use of child labour was relatively low, i.e., less than 50 per cent in the total labour force involved. The supply chain of solid waste management clearly exhibits a blatant use of child labour with total disregard to age and sensitivity to hazardous material all across the tasks of collection and sorting. Scavenging, thus appears to be the worst form of income earning opportunities offered to working children based on the facts that it does not provide any career opportunity or skills, and is also hazardous.

In sum, the continuously rising income level of urban dwellers in Pakistan leads to higher consumption level and consequently, production of higher level of solid waste does not match with the responding arrangements made by both the public and private sectors entities in disposing off and recycling the waste. The sub-optimal arrangements currently in place, clearly lacks scientific considerations and respect to human dignity.

The glorified notion of cost effectiveness in production and trade process primarily focuses on the use of cheap labour by employing children instead of bringing in the institutional reforms and the technical change to amicably overcome the emerging heaps of urban waste, causing significant environmental issues and diseases. The enormous benefits reposed in recycling of solid waste have not yet been taken as a challenge, at the level of the society.

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