

### **III. Results and Discussion**

#### **III.1 SWM System**

##### **III.1.1. SWM Practices of Waste Generators**

An ecological SWM System calls for community responsibility and participation in waste reduction, waste segregation at source, reuse, recycling and composting . Proper separation of recyclable resources at source is key to the materials' efficient collection and utilization.

The study findings show that in the three cities, household all waste generators interviewed during the study are aware of the waste segregation requirement by government. All respondents are also aware of the economic value of recyclable items which drive them to segregate those with economic value and can be sold to IWBs or junkshops.

In San Carlos City the outcome of three years of intensive Information Education and Communication (IEC) activities is its 95% success in its biodegradable and non-biodegradable system of garbage collection which reflects that SCC's waste generators have already internalized waste segregation-at-source behavior.

QC and SFC also conducted their own IEC campaigns on waste segregation but these activities were not as successful as SCC in changing the waste segregation behavior of its household residents as required by RA 9003. This lack of success is reflected in the mixed composition of wastes that are collected and finally disposed at their sanitary landfills.

##### **III.1.2. LGU Solid Waste Collection System**

SCC and SFC's collection system are LGU managed while QC employs private contractors to haul its solid waste. All three LGUs also have barangays which independently collects its solid waste. SFC and QC provide subsidies to the barangays with their own collection system. In 2011, 10 barangays in SFC have

their own collection system. In Quezon City, 56 barangays have their own collection system in 2010.

**Table 38: Comparative Analysis of SWM Collection System in the Three Study Sites**

Aspects	San Carlos City	San Fernando City	Quezon City
Management System	LGU managed	City managed – Cluster and barangay managed systems	Privately contracted to six contractors (2010); With some barangay-managed collection systems, i.e. Payatas, Holy Spirit, Bagumbuhay
Compliance with Segregated Collection	Biodegradable and non-biodegradable collection system in urban areas; Only residual wastes collected by City from rural areas	Mixed waste collection ; Segregated collection by Lingsat cluster and barangay Pagdalagan	Mixed waste collection; 4 Barangays with segregated collection
SWM Collection Budget	PhP5.3 M for collection	PhP15 M for collection and personnel services	PhP718 million for garbage collection package
Barangays with collection system (2011)	3	20	56

Noticeably, it is only in San Carlos City where biodegradable and non-biodegradable waste collection system has been consistently implemented with 95% success. As of 2011, a mixed waste collection system prevails in San Fernando City and Quezon City with some exceptions.

San Fernando City collects coconut shells and vegetable scrap separately from other market waste stream. There is barangay based segregated waste collection system in the Lingsat cluster and Pagdalagan. In Quezon City, barangays cited in 2010 for their best SWM practices including segregated collection are Barangay Holy Spirit, Tatalon and Bagong Pag-asa and Pasong Tamo. QC also engages in targeted segregated collection such as the collection of food scrap from office buildings in the QC hall.

### III.1.3. LGU Solid Waste Disposal System

All three cities have closed their dumpsites and are presently using sanitary landfills as their disposal facilities. Both SCC and SFC landfills are managed by the City while QC SLF is privately owned and managed. The SLF with the highest intake of solid wastes is QC at 1,200 tons per day.

All three sanitary landfills have waste diversion/recovery activities. All have composting activities and recovery processes for recyclables. San Fernando City has a special storage vault for sharps and busted lamps. Payatas SLF processes recovered styropor or expanded polystyrene into products such as pavers, sells plastics, tires and coconut wastes. The table below shows a comparison of the solid waste disposal system in the three study sites.

**Table 39: Comparison of SWM Disposal System in the Three Study Sites**

Aspects	San Carlos City	San Fernando City	Quezon City
Status of Controlled Dumpsite	Villarante dumpsite closed May 2009	1960-1997 – open dumpsite operations in Canaoay  1998 – Start of controlled dumpsite operations in Mameltac  2006 – closure of controlled dumpsite	Closed December 31, 2010

<b>Aspects</b>	<b>San Carlos City</b>	<b>San Fernando City</b>	<b>Quezon City</b>
Waste Disposal System	San Carlos Eco-Center and Sanitary Landfill formally opened September 13, 2007	San Fernando Sanitary Landfill started operations in 2007 under the management of CRA-KCI., the company that built the SLF. Formally turned over to SFC in October 2008	Payatas Sanitary Landfill starting January 2011
Start of SLF operations	September 13, 2007	2007	January 2011
Total Construction Cost	PhP 7.5 million	PhP 165 million	PhP130 million
Annual Operating Cost	PhP 3.75 million	PhP 4 million	PhP22 million/mo.
SLF Management System	LGU-managed; land rented	LGU owned and managed	Privately owned managed – IPM-Environmental Services Inc.;but monitored by the Payatas Operations Group of QC LGU
SLF size in hectares	5 Hectares	4.5 hectares (reserve area -5.4 hectares)	3.5 hectares
Estimated Waste Generation per day	64 tons (2011)	617.5 tons (2011)	1,889 (2009)
Estimated Daily Intake of SW at the SLF (2011)	18 tons/day	54 metric tons/day	1,200 tons/day

<b>Aspects</b>	<b>San Carlos City</b>	<b>San Fernando City</b>	<b>Quezon City</b>
% of Waste Generation Collected and brought to SLF	28%	9%	63%
Tons/Day disposed in Landfill cell	2 tons/day	4.86 tons/day	948 tons/day
Percent of SLF intake disposed in landfill cell	11%	5%	79%

Sources: From City reports and interviews with SWM personnel

#### III.1.4. LGU Waste Recovery and Diversion

##### *Barangay MRFs Waste Recovery Systems*

Under RA 9003, all barangays are required to set up their own MRFs or cluster with other barangays. There are different types of MRFs found in the three study sites. All sites have MRFs in their sanitary landfills. QC has an MRF that collects food scrap from the various offices at the City Hall. At the barangay level, there are MRFs operating at the barangay and/or sitio levels. There are also MRFs managed privately, e.g. by schools, institutions, subdivisions and commercial establishments, and garbage haulers. There are also hybrid MRFs – where junkshops are accredited as barangay MRFs.

Recyclable materials flow into these MRFs under different schemes. In SCC, the sitio barangays are drop-off centers. In SFC and QC, there are barangay managed collection systems that drop-off wastes at the MRF for sorting prior to its disposal at the SLF. In QC, Barangay Bagumbuhay MRF has redemption scheme where recyclables can be exchanged for basic commodities.

**Table 40: Comparison of Barangay MRFs in the Three Study Sites**

<b>Aspects</b>	<b>San Carlos City</b>	<b>San Fernando City</b>	<b>Quezon City</b>
Number of barangay MRFs	95 functional; 7 non-functional (poblacion barangays) (2011)	9 functional covering 15 barangays (2011)	2008: 50 (27 with composting facilities) ; 2010: 33 MRFS (7 with composting facilities)
% of barangay compliance to MRF establishment	100%	25%	22%
Mode of recyclables waste flow	Drop-off center at sitio MRFs	Barangay collection; households pay monthly garbage fees	Barangay collection (no data on barangay SWM fees)
Mode of exchange	Donation by waste generators to MRF	Donation by waste generators to MRF	Donation by waste generators to MRF; Recyclables exchanged with basic commodities

MRF establishment compliance rate of San Fernando City barangays was 25% in 2011 while it was 22% as of 2010 in Quezon City barangays. The poor compliance rate of barangays in SFC and QC could be attributed to the following factors: lack of political will, lack of awareness, lack of physical space specially in urban barangays and lack of financial and human resources for solid waste management. Some urban barangays do not feel the necessity of setting up MRFs because the city collects waste on a daily basis and there are IWBs and junkshops as well.

The non-complying barangays also do not receive any sanctions from any of the city, provincial or agencies. There are also instances where MRFs become non-functional, usually due to changes in barangay leadership. Political will expressed through allocation of technical and financial assistance and capacity building, on the other hand, enabled the establishment and functionality of the barangay MRFs in the three sites. Barangays with strong IEC and enforcement mechanisms and segregated collection systems have helped MRFs to become functional.

On the other hand, since the informal system of recyclables recovery through the IWBs and the junkshops co-exist in most of these barangays, most of the traditional recyclables such as bottles, metals, cartons and plastic containers are no longer flowing to the MRFs. Realizing these, SFC has allowed barangays to make arrangements to partner with junkshops as their MRFs.

In QC, barangays that have established MRFs are provided incentives through awards for best practices in waste segregation and recovery. To encourage the inflow of recyclables to the MRF, Barangay Bagumbuhay in QC has adopted a redemption scheme where scrap brought to the MRF can be exchanged for basic commodities.

The barangay MRFs including the junkshop cum MRF do not buy the recyclables from the waste generators. Recyclables are collected by the barangay along with the other types of waste and segregation-at-source is not strictly implemented so that the mixed wastes still have to undergo primary segregation instead of secondary sorting. SFC has not set up a standardized monitoring system to monitor the waste flow in these MRFs.

The 2010 waste diversion data of Quezon City shows that only 4% of the 675,388.79 kg of recyclables generated daily flow through its barangay MRFs. SCC and SFC do not yet have a system of monitoring the flow of recyclables in barangay MRFs although some of the barangays such as Lingsat maintain records of recyclables collected and sales income.

#### *Privately Managed MRFs*

QC and SFC have subdivision-based MRFs although SFC has no specific ordinance regulating the establishment of such MRF. The subdivisions set up a collection system and usually select a junkshop partner. In SFC, the housing association uses the funds earned from recyclables for infra-structure improvement within the subdivision.

#### *Other Types of MRFs*

In Quezon City, some of the private haulers set up their own MRFs in order to get more value out of the wastes they are contracted to collect from their clients, thus

having two income sources, the collection fee and recyclables income. However, the contracting parties such as malls having realized the economic value of the recyclables, deduct the value of the recovered recyclables from the collection fee.

Another type is the mobile MRF which the IPM-ESI, one of the private contractors engaged in waste collection, has established in Pasig City in cooperation with the Pasig City government. An IPM-ESI owned van moves around assigned communities buying recyclables which can be exchanged for commodities on the spot. IPM-ESI also operates an MRF for its paleros so that their garbage crew can sell immediately their recovered recyclables at competitive prices. This avoids the delays in the collection time of the truck along the route to the SLF.

#### *Special Recovery Events*

Waste Recycling Events through waste markets or barangay and school-based recycling events provide mechanisms for better quality recyclables that are relatively clean and dry because these are separated-at-source. These recycling events are usually done in partnership with the private sector including junkshops and non-government organizations. For instance, Quezon City reported in 2010 that 7,255.52 kgs of recyclables were recovered from the Waste Market in Malls. The Waste Markets are also mechanisms whereby special wastes such as e-wastes can flow to accredited recyclers.

#### *School-Based Materials Recovery System*

All three sites have programs for recovering recyclables and biodegradable wastes through its public schools. The program includes IEC activities and incentives for schools with best practices in SWM. Schools were also assisted in the establishment of their materials recovery systems including the setting up of waste segregation bins, composting systems and MRFs. For recyclables recovery, the City facilitated the linking up of the schools with registered junkshops, the private sector and non-government organizations. In QC, the program provides school supplies and groceries to the students in exchange for recyclable wastes.



### *Waste Recovery Systems in the SLFs*

All the three cities have materials recovery facilities in their landfills for handling recyclable and biodegradable wastes and for handling certain types of special wastes. In all of the sites, wastepickers due to their expertise in sorting undertake the waste recovery processes. Wastepickers in SCC are already integrated as workers in the SLF and its Eco Center. SFC allows 20 registered wastepickers to engage in waste picking in its SLF but also accommodates non-registered wastepickers to give them income generation opportunities. In QC, all of its SLF wastepickers are organized under different associations and are also members of a cooperative.

SCC's recovery of biodegradables is the highest among the three cities. This can be attributed to the effective segregation and collection of biodegradable from non-biodegradable wastes and the presence of a local market for composts. Conversely weak segregation at source and mixed waste collection make it difficult to compost biodegradable wastes in the two other cities. The biodegradable fraction of waste composted in SFC is due to their targeted market waste segregation and collection scheme.

**Table 41: Comparison of Waste Recovery at the SLFs in the Three Sites**

<b>Particulars</b>	<b>San Carlos City</b>	<b>San Fernando City</b>	<b>Quezon City</b>
SLF wastepickers	9 former wastepickers integrated as workers in SLF/MRF	Accredited – 20; Non-accredited – 25-35	3,000 accredited as MRF workers and organized into associations and a cooperative
Estimated Daily Inflow of SW at the SLF ( 2011)	18 tons/day	54 metric tons/day )	1,200 tons/day
Amount of recyclables recovered by SLF wastepickers/ workers per day as of 2011	4 tons	1.4 tons (excludes amount recovered by unaccredited wastepickers)	200 tons (interview with POG )
% of recyclable wastes recovered at SLF per day	22%	2%	17%
Volume and % of biodegradable wastes recovered per day at SLF	67%	3 %	4% (food scrap and firewood;no data on other biodegradable wastes)

According to recyclable waste type, , bottles and cullets lead in recovery, followed by plastics. SCC's high recovery of plastics include plastic bags not bought by the local junkshops but awaiting transport to a cement company as alternative fuel.

**Table 42: Recyclables % Recovery in Three SLFs**

Items	San Carlos City	San Fernando City	Quezon City
1. Paper	15	6	3
2. Plastics	62	12	10
3. Scrap metal/tin cans	23	6	11
4. Bottles/cullets		74	76
5. Assorted materials		2	

Wastepickers interviewed in SFC and QC cited that the amounts being recovered through wastepicking at the SLF is decreasing and most are only lower value recyclables. Higher value recyclables are “captured” through the other formal and informal recovery systems.

*Recovery of Problematic Wastes (Plastic Bags and Styrofoam)*

Plastic bags and Styrofoam (expanded polystyrene) are recyclable materials which usually end up in disposal facilities or dumped in water bodies and open spaces.

In Payatas, the wastepickers were able to retrieve 450 tons of residual plastics for use as alternate fuel at Holcim Cement (POG, 2009) and earned more than Php200 thousand but there has been no repeat buying by Holcim as of January 2012. Meanwhile another company, Poly-Green Technology & Resources Co. whose plant located near Montalban Rizal converts waste plastic to diesel is another destination of residual plastics from Payatas. A restraining factor in the recovery of plastic bags is the labor intensiveness of recovery due to its light weight and its low value at Php4/kg compared to other materials which have heavier weight and relative higher economic value.

Styrofoam used for food service called Polystyrene Paper or PSP by industry and Expanded Polystyrene used for cushioning materials such as electronic appliances are items that commonly end up in the disposal facilities in the three cities.

One of QC’s strategies is to pilot test the melting oven technology developed by the Department of Science and Technology. The plastic waste is densified through a heating system with used oil as an input. Finished products include pavers, table tops,

chairs etc. The pilot test showed viability problems due to the additional costs of used oil needed to melt the plastic. POG contacted the Polystyrene Packaging Council of the Philippines to arrange for the sale and pick-up of their styropor inventory at the SLF as an alternative measure.

### III.1.5. Waste Recovery thru the Informal Waste Sector and Junkshops

#### *Informal Waste Sector*

The informal sector in the three sites include the itinerant waste buyers, whose supply of recyclables usually come from households; the unregistered SLF wastepickers; the garbage crew or paleros who do their wastepicking at the garbage trucks; informal waste collectors and itinerant wastepickers whose recyclables come from streets and garbage collection points and illegal junkshops.

Except for QC which conducted a survey in 2007-2008, most of these sub-sectors are undocumented. . It is only in QC where an estimated 200 IWBs called Eco-aides are organized through Linis Ganda. Linis Ganda junkshops provide their Eco-aides with a daily operating capital ranging from PhP1,000 to PhP2,000. Junkshops in SCC call their IWBs “canvassers”. The provision of capital and means of transport is a common mode of arrangement between IWBs and junkshops in the three cities. Table 44 shows that IWBs buying prices in QC are higher than those of SCC due to the better buying prices of QC junkshops.

The table also shows that there are more sub-types of recyclables traded in Quezon City due to their access to consolidators and processors IWBs in QC also have higher buying prices than those in San Carlos City. QC junkshops are able to pay higher to IWBs because they can have lesser transport costs compared to the SCC junkshops.

**Table 43: Comparative Buying Prices of Itinerant Waste Buyers in SCC and QC**

<b>Items</b>	<b>San Carlos City</b>	<b>Quezon City (Linis Ganda Price)</b>
Old newspaper	Not buying	PhP6
White paper	Not buying	PhP9
Assorted paper	Not buying	PhP2.50
Old magazine/books	Not buying	PhP3
Cartons	Not buying	PhP6
Glass bottles	PhP.50	PhP1.50 (cullets: PARE price)
PET	PhP8	PhP18 (clean) PhP15 (dirty)
Hard plastics (sibakin)	PhP8*	PhP13
Plastic cup, spoon and fork		PhP7
Plastic – Hard (Malutong)		PhP5
PVC tubings		PhP2
Aluminum	PhP25-PhP30	PhP40
Aluminum can		PhP45
Bronse (Tanso dilaw)		PhP100
Copper (Tanso pula)		PhP200
Scrap iron (bakal)		PhP12
Tin cans		PhP5
Tapalodo/yero	PhP4 -PhP9	PhP8

Other informal waste workers in SCC, QC, SFC are itinerant wastepickers (IWPs and informal waste collectors). The latter earn a living by collecting wastes from streets which are not usually reached by the formal collection system. There is no existing data on street wastepickers and informal waste collectors in the three sites.

#### *Legalized Junkshops*

Junkshops play a major role in the flow of recyclables from the waste generators to the processors and traders. Although SFC and QC have junkshop ordinances that require the operators to register and get clearances from various offices, illegal

junkshops still proliferate. SCC also has illegal junkshops but has yet to formulate a junkshop ordinance.

*Unregistered Junkshops*

Unregistered junkshops also belong to the informal waste sector. In San Carlos City, there are six unregistered junkshops. Presently, it has no junkshop ordinance. San Fernando City has no data on how many unregistered junkshops are operating in the city. In Quezon City, there were 740 unregistered junkshops identified in 2008.

Problems associated with illegal junkshops are unsanitary operations, acceptance of stolen goods, traffic obstruction since their materials spill over public spaces, and environmental and health hazards of practices such as open burning and handling of electronic wastes.

**Table 44: Number of Junkshops in the Three Study Sites**

<b>Item</b>	<b>San Carlos City</b>	<b>San Fernando City</b>	<b>Quezon City</b>
Number of Registered junkshops	7 registered junkshops (2011)	16 registered junkshops (2010)	246 registered junkshops (2008)
Number of unregistered junkshops	6 unregistered junkshops	(no data on unregistered junkshops)	740 unregistered junkshops (2008)

*Classification of Junkshops*

According to Linis Ganda criteria, small junkshops are those with buying capital of PhP20,000 per day, the medium junkshops with PhP50,000 and below PhP100,000 and the big junkshops with PhP100,000 and above. Of the ten junkshops studied in the three study sites, four are big junkshops, five are medium size junkshops and one small junkshop as shown in Table 45.

**Table 45: Junkshop Classification at the Three Study Sites**

<b>Junkshops</b>	<b>Daily Buying Capital (PhP)</b>	<b>Big</b>	<b>Medium</b>	<b>Small</b>
Junkshop A-1	PhP50,000		√	
Junkshop A-2	PhP50,000		√	
Junkshop A-3	PhP300,000	√		
Junkshop B-1	PhP250,000	√		
Junkshop B-2	PhP1 million	√		
Junkshop B-3	PhP1 million	√		
Junkshop B-4	PhP50,000		√	
Junkshop B-5	PhP50,000		√	
Junkshop C-1	PhP200,000		√	
Junkshop C-2	PhP20,000			√

**Table 46: Inflow of Recyclables in Selected Junkshops at the Three Study Sites**

<b>Items</b>	<b>San Carlos City</b>	<b>San Fernando City</b>	<b>Quezon City</b>
Newspaper			42.38 tons/wk
White paper		1 ton/	36 tons/wk
Assorted Paper		1 ton	45.71 tons/wk
Boxes/cartons	5 tons/week	2.5 tons/wk	36.08 tons/wk
Assorted plastics	7 tons/week	4.7 tons/mo.	33.97 (all plastic types) / wk
Glass bottles	12.5 tons	25 tons/wk	7.9 tons/month
Bakal/tapalodo/ Lata/yero	6 tons/week	6.69 tons/wk	436.59 tons/wk
Aluminum/cans/ Copper/ bronze	50 kg/week	152.3 kg/wk	180.63 tons.wk

Table 46 shows the estimated total recyclables purchased weekly by the 10 junkshops studied. Three of the 13 SCC junkshops studied recovered 8% of the daily waste generation in SCC. Five of the 16 SFC junkshops recovered 1% of the daily waste generation in SFC. Two of the estimated 740 QC junkshops recovered 7% of the daily waste generation in QC. Aside from recyclables generated in the three cities, some of the suppliers of the junkshops studied come from nearby cities and municipalities.

### **Comparison of Selling and Buying Prices in the Three Study Sites**

The comparative data in Table 47 shows that the higher prices earned by MRFS in sanitary landfills are those in Quezon City and the lowest prices are those in San Carlos City. San Fernando City prices are also relatively lower compared to Quezon City except for assorted paper which they were able to sell at P2. CARPEL, a paper consolidator, has a buying station in SFC which might account for the high buying price. The lower carton price in QC might be due to the cartons being sold to a medium size junkshop.

**Table 47: Prices of Recyclables Sold at the SLF-based Materials Recovery Facilities**

<b>Items</b>	<b>San Carlos City</b>	<b>San Fernando City</b>	<b>Quezon City</b>
White paper	PhP2	PhP5	PhP7
Assorted paper	PhP.50	PhP2	PhP1.47-
Cartons	PhP2	PhP5	PhP3.50
PET	PhP8	PhP12	PhP30
Glass bottles	PhP1	PhP.10 to PhP1	PhP1.50 (cullets)
Plastic bags (PE)	PhP.50		PhP2
Steel	PhP8	PhP14	PhP17.50
Aluminum cans	PhP35	PhP40	PhP60
Tin cans	PhP4	PhP6	PhP9

*Selling Prices of Junkshops*



The variances in selling prices in the three cities show that generally items in SCC are the lowest since it has higher transport costs due to the location of big consolidators and processors. SFC is strategically located near traders and local processors and big consolidators, hence, its prices are sometimes higher than those of QC.

**Table 48: Selling Prices of Junkshops at the Three Study Sites**

Items	San Carlos City	San Fernando City	Quezon City
White paper	None traded	PhP8-PhP13	PhP7
Assorted paper	None traded	PhP3.50-PhP5	PhP2. – PhP2.25
Cartons	PhP5	PhP6-PhP8.40	PhP4 – PhP5
PET	PhP12-13	PhP25-PhP41	PhP36 –PhP46
Plastic containers	PhP8-PhP20 (assorted)	PhP15-PhP23	PhP15
Plastic hard		PhP12-PhP17	PhP24
Glass bottles	PhP1.20 –PhP1.50		PhP1.50 - PhP1.90 (including cullets)
Steel	PhP12-15	PhP17-21	PhP15
Aluminum cans	PhP40-PhP55	PhP45-PhP56	PhP60
Tin cans	PhP7-PhP9.50	PhP8-PhP9	PhP11

#### *Final Destination of Recyclables*

The three study sites have access to consolidators and end processors in varying degrees. The final destination of recyclables usually are the following:

- Consolidators in the study sites are either big junkshops which also act as consolidator for the small junkshops, consolidators/processors who purchase recyclables and engage in recycling activities and consolidators who are primary engaged in trading domestically or internationally.
- The final consolidators and processors operate in Metro-Cebu and Metro-Manila. The most commonly cited final destination for exported recyclables is China.

**Table 49: Consolidators, Traders and Processors in the Three Study Sites**

<b>Items</b>	<b>San Carlos City</b>	<b>San Fernando City</b>	<b>Quezon City</b>
Paper	<ul style="list-style-type: none"> <li>• Picked by CARPEL -QC – China</li> </ul>	<ul style="list-style-type: none"> <li>• Local consolidators:</li> <li>• TIPCO, Pampanga</li> <li>• Mangaldan and Dagupan Pangasinan</li> </ul>	<ul style="list-style-type: none"> <li>• CARPEL –for export to</li> <li>• China</li> <li>• ILS Junkshop in Barangay Payatas</li> </ul>
Plastics	<ul style="list-style-type: none"> <li>• Bacolod City</li> <li>• Traders in Mandaue, Cebu for export</li> </ul>	<ul style="list-style-type: none"> <li>• SFC</li> <li>• Bauang, La Union</li> <li>• Mangaldan, Pangasian</li> <li>• Carmen, Rosales, Pangasinan</li> <li>• Valenzuela City</li> </ul>	<ul style="list-style-type: none"> <li>• Valenzuela City</li> <li>• Caloocan City</li> </ul>
Bottles	<ul style="list-style-type: none"> <li>• Negros Occidental -Tanduay Distillery</li> <li>• Cebu-San Miguel Bottling Company</li> <li>• For reuse in local markets</li> </ul>	<ul style="list-style-type: none"> <li>• SFC</li> <li>• La Union:</li> <li>• Sto Niño JS</li> <li>• Bauang, La Union</li> <li>• Sta Barbara, Pangasinan, La Tondeña Distillery</li> </ul>	<ul style="list-style-type: none"> <li>• San Miguel Bottling Company</li> </ul>
Assorted metals	<ul style="list-style-type: none"> <li>• Bacolod City</li> <li>• Cebu traders for export</li> <li>• Metro-Manila traders for export or local smelters</li> <li>• Iligan City processor</li> </ul>	<ul style="list-style-type: none"> <li>• Poro Point, La Union for export by Korean and Chinese consolidators</li> <li>• San Juan, LU</li> <li>• Dagupan City</li> <li>• Sison, Pangasinan</li> </ul>	<ul style="list-style-type: none"> <li>• Payatas consolidators/ traders for local processors and export</li> </ul>

Usually there is open trading arrangement between the junkshops and consolidators and/or processors. Cash payments upon delivery or pick-up are the norm. Some consolidators have buying stations or have arrangements where they pick up the recyclables from the local junkshops.

In the case of trading between consolidators and processors, partial cash advance payment or rent-to-own arrangement for certain equipments such as baling machines and pelletizers are provided by the processor to the consolidator.

The three biggest paper consolidators in the Philippines are CARPEL Trading Inc., and Ecocycling Company and Eagle Company. They are suppliers of paper waste to the top paper manufacturing companies in the Philippines: Bataan 2020, TIPCO, and United Pulp and Paper.

According to CARPEL Trading Inc., 60% of paper wastes generated in the Philippines is recovered. CARPEL Trading Inc. exports waste paper to China while supplying the following types of paper wastes exclusively to Bataan 2020: newspaper, cartons, white bond paper. CARPEL and the exporter sign one year contracts with the price fixed for the duration of the contract. The exporter also takes care of transport costs.

Bataan 2020 provided baling machines to CARPEL Trading Inc. on a ten year rent-to-own basis. CARPEL can also borrow money to purchase paper through a credit line set up by Bataan 2020 for easy access to operating capital. CARPEL secures purchase orders from the processor which should be delivered within 15 days to 30 days. Payment period by Global 2020 is within 30 to 60 days after date of delivery.

A plastic consolidator stated that 80% of recycling companies are located in Valenzuela. The Philippine Plastics Industry Association and the Metro-Plastics Recyclers Association (MPRA) are two associations of plastic consolidators and recyclers. PPIA has 15 members that are consolidators.

One company to which the scrap metals flow from SCC is based in Valenzuela City. The company is a trader of non-ferrous metals since 1993. The company sells its materials to a local smelting plant in Valenzuela City and also exports to China. Open trading is practiced by the company so any junkshop or other consolidators can deliver to the plant anytime provided these are properly sorted by category and baled. It does not stockpile its inventory; its practice is to sell materials immediately. The company maintains a system of referrals that enable the company to choose where it can sell its materials.

### III.2. Recyclables Waste Flow

The recycling chain in the three cities show that from waste generators recyclables may go through one ring as for example household residents in SFC who sell their bottles and containers directly to the local market or several rings as shown in Figure 22. It shows the vital role of junkshops as intermediaries between waste generators and processors and the relationship of consolidators between exporters and local recyclers/processors/manufacturers. The figure also shows the flow of recyclables are not only within domestic market but also at the international or global market. Thus, the trading of recyclables as discussed earlier is affected by both the domestic and international factors.

**Figure 22: Flow of Waste Recyclables**

